



Revision Date	27-Sept-24
Responsible Group:	Operations
Revision:	001
Doc. Number	RP-PR-ROMS-EL08-MNT-0001
Page No	1 of 12

Table of Contents

1.0 SCOPE AND APPLICATION	1
2.0 ROLES AND RESPONSIBILITIES	1
3.0 PROCEDURE	2
3.1 Compressor Start & Stop Prerequisites	2
3.2 Unit Start And Load With Bypass Line	3
3.3 Unit Online With Bypass Line.....	5
3.4 Unit Shutdown Without Bypass Line	5
3.5 Unit Pre-Start Without Bypass Line After Maintenance	6
3.6 Unit Purge Without Bypass Line	7
3.7 Unit Start & Load Without Bypass Line	8
3.8 Unit Online Without Bypass Line.....	9
4.0 RECORDKEEPING	10
5.0 TRAINING	10
6.0 DEFINITIONS	10
7.0 REFERENCES	11
APPENDIX A – CHANGE REGISTER	12

1.0 SCOPE AND APPLICATION

Standardization of Starting and Stopping gas compressors for all Marathon Oil Business Units. This Standard Operating Procedure (SOP) will provide the steps necessary for a safe workflow under normal operation conditions.

This SOP will apply to Marathon Oil Employees and Staff Augmented Contractors who will work on or with gas compressors.

2.0 ROLES AND RESPONSIBILITIES

Role	Responsibility
Supervisor	<ul style="list-style-type: none"> Ensure no individual performs this procedure until the requirements in section 5.0 have been met. Ensure SOP will always be readily available for adherence during job tasks. Complete annual Read & Acknowledge through QMS assignment.
Lead Operators & Field Operators	<ul style="list-style-type: none"> Adhere to the steps outlined in this SOP Complete annual Read & Acknowledge through QMS assignment.



Revision Date

27-Sept-24

Responsible Group:

Maintenance

Revision:

001

Doc. Number

RP-PR-ROMS-EL08-MNT-0001

Page No

2 of 12

3.0 PROCEDURE

3.1 COMPRESSOR START & STOP PREREQUISITES

No.	Precaution/Action
1	<p>WARNING</p> <p>Starting & Stopping a Compressor is a High-Risk Task. Purging incorrectly may introduce oxygen into a flammable gas environment. Failure to follow the steps in this SOP may result in a life changing injury or fatality from a Hazardous Gas Exposure, Explosion, and/or a Fire.</p>
2	<p>Pressure</p> <ul style="list-style-type: none"> • Monitor vessel pressure. • Monitor backpressure valve. • Ensure lineups are correct. • Ensure safety devices and controls are active and functioning.
3	<p>Produced Liquids</p> <ul style="list-style-type: none"> • Monitor liquid levels. • Monitor level controller supply/output pressure. • Ensure lineups are correct. • Refer to SDS for handling and precaution information.
4	<p>Hot Work</p> <ul style="list-style-type: none"> • Check wind direction. • Ensure no sparks, open flames, or other ignition sources are in area: • DO NOT SMOKE outside designated area. • FOLLOW all safe work permit rules.
5	<p>RP Energy Isolation Procedure shall be followed when isolating the process equipment for maintenance/repair to prevent injury to personnel and equipment damage.</p>
6	<p>RP Work Authorization Procedure shall be followed to identify and evaluate hazards and implement appropriate precautions for personnel safety prior to and during permitted work.</p>
7	<p>Job preparation includes but is not limited to:</p> <ul style="list-style-type: none"> • Review JSA if applicable • Review the MOC Tailgate Safety Meeting form if applicable • Check Personnel Protective Equipment and required tools / equipment <p>Obtain any applicable permit(s)</p>

END COMPRESSOR START & STOP PREREQUISITES



Revision Date

27-Sept-24

Responsible Group:

Maintenance

Revision:

001

Doc. Number

RP-PR-ROMS-EL08-MNT-0001

Page No

3 of 12

3.2 UNIT START AND LOAD WITH BYPASS LINE

Step	Action
1	<p>WARNING</p> <p>Notify all affected personnel are notified that unit is being started.</p> <ul style="list-style-type: none"> • Stop work on all rotating equipment. • Loud starting noise may startle personnel in the area not expecting it.
2	<p>If the compressor is depressurized, open the bypass and blowdown valve. Then continue to Step 3.</p> <p>If the compressor was NOT depressurized, open the bypass valve, and skip to Step 9.</p>
3	<p>WARNING</p> <p>CRITICAL STEP: Open suction manual block valve and purge unit for at least 5 minutes.</p>
4	Slowly close bypass manual block valve and continue purging using the atmospheric vent.
5	<p>Set discharge manual block valve in the Full Open position.</p> <p>NOTE: <i>For units with working discharge check valve only.</i></p> <ul style="list-style-type: none"> ○ Open the discharge manual block valve.
6	Fully close the atmospheric vent.
7	<p>Close the suction manual block valve.</p> <p>NOTE: This valve may be left open if a working automatic suction control valve is in place and does not allow over pressuring of the unit.</p>
8	Slowly open the bypass valve.
9	Check equipment panel for adequate pressure and blow down to atmosphere/HP flare to the maximum starting suction pressure.
10	Place equipment panel in the Start position and set the start timer.
11	<p>Press the starter button to engage the starter.</p> <p>WARNING</p> <p>CRITICAL STEP: If the unit fails to start within 15-20 seconds of pressing the start button, disengage the starter and troubleshoot the reason for not starting. If no change to the compressor pressure occurred go to Step 9, else return to Step 1.</p>

Compressor Start & Stop Standard Operating Procedure



Revision Date	27-Sept-24
Responsible Group:	Maintenance
Revision:	001
Doc. Number	RP-PR-ROMS-EL08-MNT-0001
Page No	4 of 12

12	<p>Idle and warm up equipment.</p> <p>NOTE: Warm up until engine reaches warm up temperature defined by OEM.</p>
13	<p>Raise engine RPM to minimum loading RPM as per OEM.</p>
14	<p>Open manual suction block valve until adequate pressure is reached or until the unit's automatic suction control valve takes over.</p>
15	<p>Ensure that the discharge manual block valve is in Full-Open position.</p>
16	<p>Slowly close bypass manual block valve until fully closed.</p> <p>NOTE: Failing to slowly close these valves may cause damage to compression valves resulting in early valve failure.</p>
17	<p>Ensure suction inlet block valve to compressor is in Full-Open position. If it is not, then open slowly until valve is fully open.</p>
18	<p>Ensure the control panel lock out timer is in the zero (0) position if equipped on the unit.</p>
19	<p>Increase engine speed to desired RPM.</p> <p>NOTE: If unit is equipped with hand throttle, ensure that it is in the Full-Open position and that the engine speed is maintained by the governor or speed controller. Hand throttle cannot adjust for load changes.</p>
20	<p>Confirm that the suction control valve is holding a safe load pressure.</p>
21	<p>Open side stream gas (if equipped).</p>
22	<p>Open recycle manual block valve (if equipped).</p>
23	<p>Ensure that all discharge, suction, fuel and dump manual block valves are in the Open position.</p>
24	<p>FOR CATERPILLAR 3500 ULB MODEL ENGINES ONLY</p> <p>Close manual block valve for starter gas.</p>
<p>END UNIT START AND LOAD WITH BYPASS LINE</p>	



Revision Date

27-Sept-24

Responsible Group:

Maintenance

Revision:

001

Doc. Number

RP-PR-ROMS-EL08-MNT-0001

Page No

5 of 12

3.3 UNIT ONLINE WITH BYPASS LINE

Step	Action
1	Monitor all gas and fluid pressure, water and oil temperature, and engine RPM. Also, listen for any unusual noises.
2	Reset all safety shutdowns to the proper settings.
3	Verify that all systems are operational.
4	FOR CATERPILLAR 3500 ULB MODEL ENGINES ONLY Ensure manual block valve for start gas is shut.
5	Monitor equipment for 15 minutes after equipment is placed into service.
6	Notify affected personnel equipment is back in service before leaving location.
END UNIT ONLINE WITH BYPASS LINE	

3.4 UNIT SHUTDOWN WITHOUT BYPASS LINE

Step	Action
1	Notify all affected personnel that equipment is being taken offline.
2	Decrease engine speed by 25 percent.
3	Ensure that the control panel lock out timer is in the zero (0) position.
4	Slowly open atmospheric vent or flare until fully open.
5	Decrease engine speed by 50 percent.
6	Close manual suction block valve by 85-90 percent.
7	Decrease engine speed to idle.
8	Allow engine to cool down by running under idle.



Revision Date

27-Sept-24

Responsible Group:

Maintenance

Revision:

001

Doc. Number

RP-PR-ROMS-EL08-MNT-0001

Page No

6 of 12

9	Press stop button to activate shutdown sequence.
10	Close suction manual block valve.
11	Close discharge manual block valve.
12	Close starter pressure block valve to the unit.
13	Vent fuel system prior to starting any internal service. NOTE: For units that have blowdown piped into a common manifold, open atmospheric vent block and close the manifold blowdown block valve.
END UNIT SHUTDOWN WITHOUT BYPASS LINE	

3.5 UNIT PRE-START WITHOUT BYPASS LINE AFTER MAINTENANCE

Step	Action
1	Verify that all repairs are complete.
2	Ensure all tools and trash are removed from the skid.
3	Check that the suction inlet block valve to the compressor is fully closed.
4	Verify that the blowdown manual block valve is in the Open position and is venting the unit to atmosphere. WARNING Stand upwind/cross wind prior to blowing down to atmosphere to prevent hazardous gas exposure. If compressor uses sour gas and standing upwind/cross wind is not possible, donning fresh air with a backup person on location will be required prior to blow down.
5	Confirm that all panel gauges read zero. WARNING CRITICAL STEP: If all panel gauges do not read zero, Immediately STOP THE JOB and find the source of trapped pressure.
6	Open the fuel manual block valve.

Compressor Start & Stop Standard Operating Procedure



Revision Date	27-Sept-24
Responsible Group:	Maintenance
Revision:	001
Doc. Number	RP-PR-ROMS-EL08-MNT-0001
Page No	7 of 12

7	Verify that automatic fuel shut off valve is reset.
8	Open starter manual block valve.
9	Reset equipment panel (and engine panel if equipped).
10	Check all oil and water levels.
11	Pre-lube unit (if equipped with pre-lube).
12	Make sure the throttle is set in Idle/Low position. Check controller position for equipment with speed controllers.
13	Open the discharge manual block valve (units with working discharge check valve only).

END UNIT PRE-START WITHOUT BYPASS LINE

3.6 UNIT PURGE WITHOUT BYPASS LINE

Step	Action
1	All affected personnel are notified that purge is being started.
2	<p>Atmospheric vent/blowdown manual block valve is in the Open position and venting the unit to atmosphere.</p> <p>WARNING</p> <p>CRITICAL STEP: If equipment is piped to a manifold system, close atmospheric vent, and open manifold blowdown.</p> <p>Stand upwind/cross wind prior to blowing down to atmosphere to prevent hazardous gas exposure. If compressor uses sour gas and standing upwind/cross wind is not possible, donning fresh air with a backup person on location will be required prior to blow down.</p>
3	<p>WARNING</p> <p>CRITICAL STEP: Open suction manual block valve purging unit for at least 5 minutes.</p>
4	Close manual suction block valve.

END UNIT PURGE WITHOUT BYPASS LINE AFTER MAINTENANCE



Revision Date

27-Sept-24

Responsible Group:

Maintenance

Revision:

001

Doc. Number

RP-PR-ROMS-EL08-MNT-0001

Page No

8 of 12

3.7 UNIT START & LOAD WITHOUT BYPASS LINE

Step	Action
1	<p>WARNING</p> <p>Notify all affected personnel are notified that the unit is being started.</p> <ul style="list-style-type: none"> • Stop work on all rotating equipment. • Loud starting noise may startle personnel in the area not expecting it
2	Place equipment panel in the Start position and set the start timer.
3	<p>Press the starter button to engage the starter.</p> <p>NOTE: If equipment fails to start within 15-20 seconds of pressing button, disengage starter.</p>
4	<p>FOR EQUIPMENT WITH AUTO START:</p> <p>Press reset button to activate pre-lube system (equipment will start automatically).</p>
5	<p>Idle and warm up equipment.</p> <p>NOTE: Warm up until engine reaches warm up temperature defined by OEM.</p>
6	Raise engine RPM to minimum loading RPM as per OEM.
7	Open manual suction block valve until adequate pressure is reached or until the equipment's automatic suction control valve takes over.
8	Discharge manual block valve is in Full Open position.
9	<p>WARNING</p> <p>CRITICAL STEP: Purge equipment for a minimum of five minutes from idle and warm up until load.</p> <p>NOTE: This valve may be left open if a working automatic suction control valve is in place and does not allow over pressuring of the unit.</p>
10	Close blowdown valve slowly until fully closed.
11	<p>Increase engine speed to desired RPM for the operational conditions.</p> <p>NOTE: Desired RPM will vary with compression demand.</p>

Compressor Start & Stop Standard Operating Procedure



Revision Date	27-Sept-24
Responsible Group:	Maintenance
Revision:	001
Doc. Number	RP-PR-ROMS-EL08-MNT-0001
Page No	9 of 12

	If the unit is equipped with hand throttle, ensure that it is in the Full Open position and that the engine speed is maintained by the governor or speed controller. Hand throttle cannot adjust for load changes.
12	Ensure suction inlet block valve to compressor is in Full Open position. If it is not, then open slowly until valve is fully open.
13	Ensure that the control panel lock out timer is in the zero (0) position.
14	Open side stream gas (if equipped).
15	Open recycle manual block valve (if equipped).
16	Ensure that all discharge, suction, fuel and dump manual block valves are in the Open position.
17	FOR CATERPILLAR 3500 ULB MODEL ENGINES ONLY Close manual block valve for start gas.
END UNIT START & LOAD WITHOUT BYPASS LINE	

3.8 UNIT ONLINE WITHOUT BYPASS LINE	
Step	Action
1	Monitor all gas and fluid pressure, water & oil temperatures, and engine RPM. Also listen for any unusual noises.
2	Reset all safety shutdowns to the proper setting.
3	Verify that all systems are operational.
4	FOR CATERPILLAR 3500 ULB MODEL ENGINES ONLY Ensure manual block valve for start gas is shut.
5	Monitor equipment for 15 minutes after equipment is placed into service.
6	Notify affected personnel equipment is back in service before leaving location.
END UNIT ONLINE WITHOUT BYPASS LINE	



Revision Date

27-Sept-24

Responsible Group:

Maintenance

Revision:

001

Doc. Number

RP-PR-ROMS-EL08-MNT-0001

Page No

10 of 12

4.0 RECORDKEEPING

All records are maintained according to the Company Records Retention Schedule.

5.0 TRAINING

Job roles followed by training level for this procedure are as follows:

- Lead Operator, Level 3

6.0 DEFINITIONS

Terms	Definitions
Idle	Gas compressor engine RPM that are defined by OEM and no gas is being compressed by the compressor.
Isolation	The act of locking out all energy sources from the equipment that work is being performed on.
Load	The act of raising or lowering pressure and RPM on a gas compressor. Using the panel pressure and RPM gages to ensure load is within the designed operation pressure to place it back into full service.
On-Line	When all mechanical, safety, or environmental issues for a gas compressor have been resolved, load has been properly set, all safety devices have been set, and the equipment is under a normal load.
Pre-Start	Inspecting equipment for safety and mechanical issues prior to starting the gas compressor.
Purge	Opening the suction gas supply to the compressor venting out the blowdown to ensure all air is out of the process piping (PURGING AIR) and gas flows freely through all process piping and cylinders prior to start up. The act of purging air should not be less than five minutes minimum. Purging will also include closing off process gas and blowing "Sweet" or "Inert" gas through the process system and subsequent verification that the level of a hazardous gas is below a level where it is safe to work without breathing air. A third form of purging includes keeping a blanket of "Sweet" gas or "Inert" gas on the pressure packing, called a Packing Purge, to prevent Hazardous Gas from entering the compressor frame. Some Packages have a manually operated purge for each distance piece throw.
Shutdown	When a gas compressor has to be taken off-line due to a safety or mechanical issues.

Compressor Start & Stop Standard Operating Procedure



Revision Date	27-Sept-24
Responsible Group:	Maintenance
Revision:	001
Doc. Number	RP-PR-ROMS-EL08-MNT-0001
Page No	11 of 12

Start	The act of removing all locks and tags, pre-lubing, making final inspection to bring a gas compressor back into service after all mechanical or safety issues have been resolved.
Warm-Up	The act of running the engine and compressor without a load at idle RPM until the proper oil and water temperatures are reached.

END DEFINITIONS

7.0 REFERENCES

None

