

Report Date: 25 Sep 2013

Summary Report for Individual Task
061-271-1472
Perform Maintenance on M198 Equilibrator Cylinders (U6)
Status: Approved

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

Condition: Given a howitzer scheduled for maintenance with the tube elevated at 1,000 mils, a field artillery mechanic's tool kit, cleaning equipment, and lubricants.

Standard: Maintain the equilibrators cylinders so that the pressure in the cylinders are stable at a PSI between 1750 and 1800.

Special Condition: None

Safety Level: Low

MOPP:

Task Statements

Cue: Howitzer is scheduled for maintenance.

DANGER

None

WARNING

None

CAUTION

None

Remarks: None

Notes: None

Performance Steps

1. Disassemble the equilibrator cylinders.

- a. Loosen screw.
- b. Remove hose clamp from end of equilibrator cylinder.
- c. Move rubber bellows away from end of equilibrator cylinder.

Remarks: When removing plugs, oil may squirt out under pressure. Cover plug with wiping rag and allow pressure to dissipate prior to removal.

d. Remove plug.

Note: There are three different configurations of plugs- 5/16x24 hexhead, 3/8x24 hexhead, and 1/8x27 allen head.

e. Remove plug and packing .

2. Service the equilibrator cylinders.

- a. Check for broken, damaged, or missing parts.
- b. Repair is by replacement of authorized parts.

Note:

A film oil on the piston rod(oil leakage) is normal and is necessary for lubrication on the piston rod.

- c. Inspect end of equilibrator cylinder and piston rod for evidence of oil leakage.
- d. Use funnel and fill cavity behind filler hole with hydraulic fluid (2 to 4 oz).

3. Reassemble the equilibrator cylinders.

- a. Apply tape 1-1/4 times around threads of the 1/8 x 27 allen head plug and tighten.
- b. Install new packing and plug and torque to 14 to 15 ft-lb (62.28 to 66.72 N -m).
- c. Position rubber bellows over end of equilibrator cylinder.
- d. Install hose clamp and tighten screw. Lower weapon to travel lock position and install travel lock.

WARNING

Nitrogen under pressure is dangerous. Eye protection must be worn throughout this procedure.

4. Check nitrogen pressure.

Note:

Procedure is written for one equilibrator cylinder but applies to both.

For accurate nitrogen check, cannon tube must be in travel lock position and equilibrator adjustment screw pointers set at zero

- a. Remove protective dust cap.

b. Remove valve cap.

Note:

Apply soap to check valve prior to connecting crossover lines. Checking valve for leaks prior to opening will eliminate it as the cause of low pressure.

c. Connect crossover line to the two check valves.

Remarks:

The nitrogen charging kit must have a gage that will read 3000 psi(20,685kPa) for this procedure. Always clean nitrogen charging device by blowing hose out with pressure from nitrogen tank prior to connecting hose to the equilibrators.

d. Open check valve slowly until pressure is registered on gauge. Pressure reading should indicate 1750-1800 psi (12,066-12,411 kPa).

e. With adjustment pointer at zero, open bleeder valve slowly and regulate pressure on gauge at 1750-1800psi (12,066-12,411 kPa), then close.

f. Close check valve.

g. Open bleeder valve to allow nitrogen to bleed off.

h. Disconnect air pressure gauge assembly.

i. Coat check valve with a soapy solution to check for leaks. If bubbles form, close check valve further. If bubbles cannot be stopped, notify direct maintenance.

j. Install valve cap and protective dust cap.

Note:

Nitrogen pressure should be checked and adjusted at ambient temperature. Equilibrator adjustment screws should be used for minor temperature variations. When weapon is hard to elevate with adjustment screw pointer set at maximum adjustment, low pressure is indicated. Charge equilibrators

WARNING

Nitrogen under pressure is dangerous. Eye protection must be worn throughout this procedure.

5. Service by charging nitrogen pressure.

a. Connect pressure regulator to nitrogen tank.

b. Remove two protective dust caps.

c. Remove two valve caps.

d. Connect crossover line to check valves on each equilibrators cylinder.

e. Attach air pressure gauge assembly to crossover line.

f. Attach nitrogen charging device to air pressure gauge assembly and open valve on nitrogen charging device.

g. Close regulator valve by turning counterclockwise.

WARNING

Howitzer must be in travel lock position.

h. Open two check valves slowly until equilibrator pressure registers on air pressure gauge assembly.

Note:

Before charging equilibrators, make sure adjustment screws are set to zero

If only one equilibrator cylinder requires pressurizing, open only the check valve to that equilibrator cylinder.

i. Open shutoff on nitrogen tank until pressure is registered on the 4000-psi gauge.

j. Open regulator valve by slowly turning clockwise until 3000-psi gauge registers 50 psi (345 kPa).

k. Turn valve connection handle to open valve core in valve connection.

l. Close valve.

m. Open bleeder valve to allow nitrogen to bleed from equilibrator cylinder; close bleeder valve.

Note: If new equilibrator cylinder is being installed, repeat steps i thru m. This will remove condensation from within the equilibrator cylinder.

Filling equilibrator cylinder too fast will cause heating of equilibrator cylinder, resulting in inaccurate charging.

n. Open valve.

Note:

Open valve connection handle when reading on 3000-psi gauge reads the same as air pressure gauge

Regulate nitrogen in step o to match pressure in air pressure gauge. This should be done prior to opening valve connection.

o. Adjust regulator valve slowly in 100-psi (689 kPa) increments. Open valve connection handle when readings on gauges match. Allow time for nitrogen flow to stop between adjustments until air pressure gauge reads 1800 psi (12,411 kPa).

Note:

If the only equilibrator cylinder is being charged, it will be necessary to open check valve of both the equilibrator cylinders before performing step p so that the pressure of equilibrator cylinders will be equalized.

p. Close valve and allow equilibrator cylinder to cool for approximately 30 minutes.

q. Turn valve connection handle to open valve core in valve assembly if not already open.

Remarks:

Nitrogen pressure should be checked and adjusted at ambient temperature. Equilibrator adjustment screws should be used for minor temperature variations.

r. With adjustment pointer at zero, open bleeder valve slowly, and regulate the pressure on air pressure gauge between 1750 and 1800 psi (12,066 and 12,411 kPa) at the ambient temperature at which the weapon will be used; then close.

s. Close check valve on both equilibrator cylinders.

t. Close shutoff valve.

u. Open bleeder valve to allow nitrogen to bleed off.

v. Disconnect nitrogen charging device and nitrogen checking device.

w. Disconnect crossover line.

x. Coat check valves with a soapy solution to check for leaks. If bubbles form, close check valve further. If bubbles cannot be stopped, notify direct support maintenance.

y. Install two valve caps and two protective dust caps.

z. Remove pressure regulator from nitrogen tank. Install nitrogen tank cover and mark nitrogen tank with approximate psi still contained.

(Asterisks indicates a leader performance step.)

Evaluation Preparation: Setup: Ensure that all information, references, and equipment required to perform the task are available. Use the performance measures and the references to score the Soldier's performance. Brief the Soldier. Tell the Soldier what he is required to IAW the task conditions and standards.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Disassembled the equilibrator cylinders.			
2. Serviced the equilibrator cylinders.			
3. Reassembled the equilibrator cylinders.			
4. Checked nitrogen pressure.			
5. Serviced by charging nitrogen pressure.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	TM 9-1025-211-10	Operators Manual (Crew) for Howitzer, Medium, Towed: 155-MM, M198 (NSN 1025-01-026-6648) (EIC: 3EL) {TM 08198A-10/1} (Reprinted W/Basic Incl C1-4)	No	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Composite Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination. 1. Task may involve personal exposure to hazardous substances. 2. Brief personnel IAW OSHA HAZCOM requirements.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks : None