

**SECTION 11 11 16
VEHICLE SERVICE EQUIPMENT**

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete between //----// if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Equipment items as listed below by Equipment Identifier:
1. VLP1-PUMP, AIR PISTON 5:1 RATIO Engine Oil (EO).
 2. VLP2-PUMP, AIR PISTON 5:1 RATIO Engine Oil (EO).
 3. VLP3-PUMP, AIR PISTON 50:1 RATIO Chassis Grease (CG).
 4. VLP4-PUMP, AIR PISTON 5:1 RATIO Gear Oil (GO).
 5. VLP5-PUMP, AIR PISTON 5:1 RATIO Hydraulic Oil (HO).
 6. RB-1 Reel Bank (HO, EO, EO, GO, CG, CA).
- B. Roughing-in installation of equipment, and final connection of utilities, with labor, services, and incidentals necessary for complete and operational equipment installation including required supports, hangers, fasteners and anchorage devices and methods.

1.2 RELATED SECTIONS

- A. Section 01 00 00, GENERAL REQUIREMENTS.
- B. Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- C. Building Components for Attachment of Hangers: Section 05 31 00, STEEL DECKING, // and Section 05 36 00, COMPOSITE METAL DECKING. //
- D. Section 05 50 00, METAL FABRICATIONS.
- E. Section 07 84 00, FIRESTOPPING.
- F. Flashing for Wall and Roof Penetrations: Section 07 60 00, FLASHING AND SHEET METAL.
- G. Section 07 92 00, JOINT SEALANTS.
- H. Section 09 91 00, PAINTING.
- I. Section 11 11 14, MOTOR VEHICLE LIFTS.
- J. Section 22 15 00, GENERAL SERVICE COMPRESSED-AIR SYSTEMS.
- K. Section 23 13 23, CONCRETE ABOVEGROUND FUEL STORAGE.

1.3 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic

designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

SPEC WRITER NOTES:

- 1. Remove reference citations that do not remain in Part 2 or Part 3 of edited specification.
- 2. Verify and make dates indicated for remaining citations the most current at date of submittal; determine changes from date indicated on the TIL download of the section and modify requirements impacted by the changes.

B. American Society for Testing and Materials (ASTM):

A167-17	Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
A179/A179M-19	Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes

1.4 QUALITY ASSURANCE

A. Manufacturer's Representative:

- 1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out, and start up.
- 2. Training: Provide a qualified manufacturer's representative to provide training to Owner's maintenance personnel in operation and maintenance of specified equipment.

1.5 SUSTAINABILITY REQUIREMENTS

A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, for project // local/regional materials, // low-emitting materials, // recycled content, // certified wood, // _____// requirements.

1.6 SUBMITTALS

A. Product Data:

- 1. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, and with requirements in the individual specification sections.
- 2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid and/or dusty conditions.
- B. Indelibly label all containers, including those combined in others, on outside with item description(s) per title and Equipment Identifier of this specification.
- C. Provide equipment and material specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.8 LABELING

- A. Securely attach in a prominent location, on each major item of equipment, a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.
- B. Provide only new electrical equipment and materials listed by Underwriter's Laboratories, Inc. (UL) in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

PART 2 - PRODUCTS**2.1 PUMP, AIR PISTON 5:1 RATIO ENGINE OIL (EO) - EQUIPMENT IDENTIFIER: VLP PUMP 1, VLP PUMP 2**

- A. Capacities/Dimensions:
 - 1. Products: Engine Oil (EO).
 - 2. Maximum fluid pressure: 6200 kPa (900 PSI).
 - 3. Air motor diameter: 75 mm (3 inches).
 - 4. Operating range: 275 to 1240 kPa (40 to 180 PSI).
 - 5. Fluid Flow rate at 80 cycles/min: 10.6 liters/min (2.8 GPM).
 - 6. Air consumption (approximate) at 689 kPa (100 PSI): 12.7 liters/sec (27 SCFM).
 - 7. Air Inlet: 9.5 mm (3/8 inch) NPT(F).
 - 8. Material Outlet: 12.7 mm (1/2 inch) NPT(F).
 - 9. Material Inlet: 38 mm (1-1/2 inches) NPT(F).
- B. Features/Performance/Construction:
 - 1. Provide pneumatic operated piston pump operable with maximum air pressure of 1240 kPa (180 PSI).
 - 2. Provide with complete assembly, including adapters for mounting on storage drums, combination air filter, regulator, pressure gauge,

lubricator, air and product valves, and hose and fitting kit suitable for product.

3. Provide air motor of a non-corrosive design and with no metal-to-metal contact compatible with product being delivered.
4. Provide thermal relief valves for the pumping system.

C. Accessories:

1. Air regulator and pressure gauge 12.7 mm (1/2 inch).
2. Low level cut off.

D. Utility Requirements: Compressed air, 689 kPa (100 PSI), 12.7 mm (1/2 inch) NPT(F), provide filter, regulator, and valves.

2.2 PUMP, AIR PISTON 50:1 RATIO CHASSIS GREASE (CG) - EQUIPMENT IDENTIFIER:

VLP PUMP 3

A. Capacities/Dimensions:

1. Products: Chassis Grease (CG).
2. Maximum fluid pressure: 57,900 kPa (8400 PSI).
3. Air motor diameter: 75 mm (3 inches).
4. Operating range: 206-965 kPa (30-140 PSI).
5. Maximum continuous duty flow rate: 0.5 kg/minute (1.19 pounds/minute).
6. Air consumption (approximate) at 689 kPa (100 PSI): 10.7 liters/sec (27 SCFM).
7. Air inlet: 9.5 mm (3/8 inch) NPT(F).
8. Material outlet: 6.3 mm (1/4 inch) NPT(F).
9. Material inlet: Slotted.

B. Features/Performance/Construction:

1. Provide pneumatic operated piston pump operable with maximum air pressure of 1034 kPa (150 PSI).
2. Provide with complete assembly, including combination air filter, regulator, pressure gauge, lubricator, air and product valves, and hose and fitting kit suitable for product.
3. Provide air motor of a non-corrosive design with no metal-to-metal contact compatible with product being delivered.
4. Provide base, inductor plate, elevator, and carriage support system for chassis grease pump with inductor plate.

C. Accessories: Air regulator and Gauge 9.5 mm (3/8 inch).

D. Utility Requirements: Compressed air, 689 kPa (100 PSI), 12.7 mm (1/2 inch) NPT(F), provide filter, regulator, and valves.

**2.3 PUMP, AIR PISTON 5:1 RATIO GEAR OIL (GO) - EQUIPMENT IDENTIFIER: VLP
PUMP 4**

A. Capacities/Dimensions:

1. Products: Gear Oil (GO).
2. Maximum fluid pressure: 6200 kPa (900 PSI).
3. Air motor diameter: 75 mm (3 inches).
4. Operating range: 275 to 1240 kPa (40 to 180 PSI).
5. Fluid Flow rate at 80 cpm: 10.6 liters/min (2.8 GPM).
6. Air consumption (approximate) at 689 kPa (100 PSI): 12.7 liters/sec (27 SCFM).
7. Air inlet: 9.5mm (3/8 inch) NPT(F).
8. Material outlet: 12.7 mm (1/2 inch) NPT(F).
9. Material inlet: 38 mm (1-1/2 inches) NPT(F).

B. Features/Performance/Construction:

1. Provide pneumatic operated piston pump operable with maximum air pressure of 1240 kPa (180 PSI).
2. Provide with complete assembly, including adapters for mounting on storage drums, combination air filter, regulator, pressure gauge, lubricator, air and product valves, and hose and fitting kit suitable for product.
3. Provide air motor of a non-corrosive design with no metal-to-metal contact compatible with product being delivered.
4. Provide thermal relief valves for the pumping system.

C. Accessories:

1. Air regulator and pressure gauge, 12.7 mm (1/2 inch).
2. Low level cut off.

D. Utility Requirements: Compressed air, 689 kPa (100 PSI), 12.7 mm (1/2 inch) NPT (F), provide filter, regulator, and valves.

**2.4 PUMP, AIR PISTON 5:1 RATIO HYDRAULIC OIL (HO) - EQUIPMENT IDENTIFIER:
VLP PUMP 5**

A. Capacities/Dimensions:

1. Products: Hydraulic oil (HO).
2. Maximum fluid pressure: 6200 kPa (900 PSI).
3. Air motor diameter: 75 mm (3 inches).
4. Operating range: 275 to 1240 kPa (40 to 180 PSI).
5. Fluid Flow rate at 80 cpm: 10.6 liters/min (2.8 GPM).
6. Air consumption (approximate) at 689 kPa (100 PSI): 12.7 liters/sec (27 SCFM).

7. Air Inlet: 9.5 mm (3/8 inch) NPT(F).
 8. Material outlet: 12.7 mm (1/2 inch) NPT(F).
 9. Material Inlet: 38 mm (1-1/2 inches) NPT(F).
- B. Features/Performance/Construction:
1. Provide pneumatic operated piston pump operable with maximum air pressure of 1240 kPa (180 PSI).
 2. Provide with complete assembly, including adapters for mounting on storage drums, combination air filter, regulator, pressure gauge, lubricator, air and product valves, and hose and fitting kit suitable for product.
 3. Provide air motor of a non-corrosive design with no metal-to-metal contact compatible with product being delivered.
 4. Provide thermal relief valves for the pumping system.
- C. Accessories:
1. Air regulator and pressure gauge 12.7 mm (1/2 inch).
 2. Low level cut off.
- D. Utility Requirements: Compressed air, 689 kPa (100 PSI), 12.7 mm (1/2 inch) NPT(F), provide filter, regulator, and valves.

2.5 REEL BANKS, GENERAL

- A. Capacities/Dimensions:
1. Overall reel dimensions, nominal:
 - a. Width: 21.5 cm (8-1/2 inches).
 - b. Height: 54 cm (21-1/6 inches).
 - c. Reel diameter: 51 cm (20 inches).
 2. Reel fluid inlet:
 - a. Air: 12.7 mm (1/2 inch) NPT(M).
 - b. Chassis grease: 9.5 mm (3/8 inch) NPT(M).
 3. Hose:
 - a. Air:
 - 1) Length: 18.3 m (60 feet).
 - 2) Inside diameter: 9.5 mm (3/8 inch).
 - 3) Working pressure: 1241 kPa (180 PSI).
 - b. Chassis Grease:
 - 1) Length: 15.3 m (50 feet).
 - 2) Inside diameter: 6.3 mm (1/4 inch).
 - 3) Working pressure: 34,400 kPa (5,000 PSI).
 - c. Gear Oil:
 - 1) Length: 15.3 m (50 feet).

- 2) Inside diameter: 12.7 mm (1/2 inch).
- 3) Working pressure: 10,300 kPa (1,500 PSI).

d. Other commodities:

- 1) Length: 15.3 m (50 feet).
- 2) Inside diameter: 12.7 mm (1/2 inch).
- 3) Working pressure: 6,895 kPa (1,000 PSI).

B. Features/Construction:

1. Construction: Fabricate frames, discs, and drum of heavy gauge steel.
2. Double pedestal arm: Reel frame to have double pedestal arms that are welded and gusseted.
3. Hose guide arm: Reel hose guide arm to be adjustable with nylon rollers on all four sides of roller assembly at hose opening.
4. Ball stop: Adjustment of hose extension length by ball stop.
5. Rewind mechanism: Enclose and fasten reel spring to reel drum with a reinforcing clip.
6. Bearings and ratchet latch: Reel to have permanently lubricated bearings and extra-large ratchet latch with audible hose position lock.
7. Hose covers and tubes: Provide chassis grease hose with a Buna-N tube and Buna-N PVC cover; provide other commodity hoses with a Buna-N nitrile tube with nitrile PVC cover.
8. Delivery kits: Each commodity hose to be fitted with the dispensing control as listed.
 - a. Compressed Air (CA): Quick disconnect air coupler with necessary adapter fitting, Industrial Interchange Series 6.3 mm (1/4 inch) female.
 - b. Gear Oil (GO): Electronic in-line style English metered totalizing dispenser set to dispense in quarts to .01 increments.
 - c. Chassis Grease (CG): High pressure control valve with knurled grip body, 6.3 mm (1/4 inch) with taper nose coupler and extension.
 - d. Engineer Oil (EO): Electronic in-line style English metered totalizing dispenser set to dispense in quarts to .01 increments.
 - e. Hydraulic Oil (HO): Electronic in-line style English metered totalizing dispenser set to dispense in pints to .01 increments.

C. Accessories:

1. Inlet Hose Kit: Each commodity reel to be fitted with the inlet hose kit as listed.
 - a. Chassis grease: 9.5 mm (3/8 inch) ID by 61 cm (24 inch), high pressure hose and fittings, rated for 27,580 kPa (4,000 PSI), one each.
 - b. Other commodities: 12.7 mm (1/2 inch) ID by 61 cm (24 inch), medium pressure hose and fittings, rated for 13,790 kPa (2,000 PSI), one each.
 - c. Mounting brackets.
 - d. Mounting channels: Holds three reels.
 - e. Ball stop: One for each reel.
 2. Identification Labels: Each commodity reel to have a 19 mm by 114 mm (3/4 by 4-1/4 inch) metal identification label indicating the commodity, attached adjacent to each hose guide arm roller assembly. Label kits including label and mounting hardware as listed for each commodity. Note: Label is listed before ().
 - a. Compressed air (CA).
 - b. Grease (CG).
 - c. Engine Oil (EO).
 - d. Gear Oil (GO).
 - e. Hydraulic Oil (HO).
- D. Utility Requirements: Provide process piping from product pumps to point of connection for each reel specified herein.
- E. Finish: Durable enamel in manufacturer's standard color.

2.6 REEL BANK (HO, EO, EO, GO, CG, CA) - EQUIPMENT IDENTIFIER: RB-1

- A. Reel Bank consists of one each (HO) reel, two each (EO) reel, one each (GO) reel, one each (CG) reel, and one each (CA) reel as delineated in "REEL BANKS, GENERAL" of this specification section.

2.7 LUBRICATION FLUID PIPING

- A. Use new pipe that is clean and free of rust and scale.
- B. Provide chassis grease supply lines based on 34,475 kPa (5,000 PSI) maximum working pressure.
- C. Provide motor oil, gear lube or ATF lubricant supply lines based on a 6,895 kPa (1,000 PSI) maximum working pressure.
- D. Provide the pipe material for each type of fluid and pressure recommended by the equipment manufacturer or in no case less than shown below:

Fluid Type	Pipe Type	Min. Wall Thickness	Fitting Type	Joint Type	Valve Type
Low Pressure Oils (EO, HO, GO)	ASTM A179 Seamless Steel Tubing	3/4"=0.049 1"=0.065 1-1/2"=0.083	SAE J1065 Hydraulic Tube Fitting 1,000 PSI	Compression 1,000 PSI	ASTM A-167 Carbon Steel Ball Valve 1,000 PSI
Chassis Grease (CG)	ASTM A179 Seamless Steel Tubing	3/4"=0.095 1"=0.109 1-1/4"=0.120	SAE J1065 Hydraulic Tube Fitting 4,000 PSI	Compression 4,000 PSI	Forged Steel Ball Valve 4,000 PSI

PART 3 - EXECUTION

3.1 INSPECTION

- A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.
- B. Inspect equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all equipment items and specified accessories.

3.2 INSTALLATION

- A. Perform work under direct supervision of foreman or construction Superintendent with authority to coordinate installation of scheduled equipment with contracting Officer's Technical Representative.
- B. Install equipment in accordance with plans, shop drawings, and manufacturer's instructions:
 1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level (or slight slope as required by instructions), plumb, and at right angles to adjacent work.
 2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.
 3. Anchorage:
 - a. Attach equipment as detailed or directed by COTR.
 - b. Installation fasteners installed in a manner to avoid scratching or damaging adjacent surfaces.
 - c. Provide backup and support where required.
- C. Provide interim supports for air piston units until Owner has obtained product in specified containers.

- D. Connect compressed air supply lines to air piston pumps and compressed air hose reel in accordance with Section 22 15 00, GENERAL SERVICE COMPRESSED-AIR SYSTEMS.

3.3 LUBRICATION PRODUCT PIPING

- A. General: Install product piping from air piston pumps to the suspended hose reels and connect.
- B. Size mainline and branch line product piping in accordance with the manufacturer's installation and piping recommendations and based on the supply line length.
- C. All fittings, joints, and valves per fluid type must match the tubing rating and burst pressure rating of fluid type.
- D. Install piping in accordance with plans and NFPA codes and regulations.
 - 1. Piping must be a minimum of 1.83 m (6 feet) from heating devices.
- E. Remove scale and dirt on inside and outside before assembly.
- F. Prepare tubing connections to equipment with flanges or unions as required to complete connections.
- G. Route tubing in an orderly manner, grouping wherever practical at common elevations, and bend tubing wherever change in direction is necessary; use 90 degree fittings only when tubing cannot be bent to change directions.
- H. Provide kink-free bends.
- I. Install tubing to conserve building space and not interfere with the use of the space; install tubing to provide the maximum height underneath.
- J. Install tubing to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- K. Provide clearance for installation and access to valves and fittings.
- L. Prepare product piping for priming and painting in accordance with the requirements of Section 09 91 00, PAINTING.
- M. Remove all filings and any other matter from tubing and flush the system with oil before attaching dispensing valves and meters prior to testing.
- N. Label piping with product type and direction of flow every 6.1 m (20 feet) or change in direction.

3.4 TESTING

- A. Test Lubrication Product piping to 110 percent of working pressure.

- B. After final connections are made and prior to final acceptance, test specified equipment for compliance with specifications in the presence of the RE/COR using acceptance procedures provided by the manufacturer.

3.5 CLEANUP

- A. Touch-up damage to painted finishes.
- B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.
- C. Clean area around equipment installation and remove packing and installation debris from job site.
- D. Notify RE/COR for acceptance inspection.

3.6 TRAINING

- A. Direct the Manufacturer's technical representative to provide two hours (minimum) of training to designated maintenance personnel in operation and maintenance of the specified equipment.
- B. Coordinate with RE/COR training schedule and list of personnel to be trained.

- - - E N D - - -