



# Design Concepts

Eaton's Carter product line is the leading manufacturer of nozzles qualified in accordance with SAE AS5877 (MIL-N-5877). Eaton's Carter Model 64349H underwing refueling nozzle is listed as being qualified on the QPL. The specification defines four nozzles, D-1, D-1R, D-2 and D-2R. The D-1 and D-1R nozzles have an inlet body that includes a 45° elbow. The D-1R is a D-1 with the addition of a hose end regulator. The D-2 and D-2R (includes a regulator) have straight inlets. Both units have a military standard 6-bolt inlet flange in accordance with MS33786-40. In addition Model 64349 can be purchased with various options to tailor a nozzle to fit the system requirements. These additional options, although widely utilized in the military, are not covered by any particular specification.

## New Inlet Option

Model 64349 is now available with a D-3 inlet coupling that can be changed from the D-1 to the D-2 configuration and vice versa. This can be done without tools simply by swiveling the inlet to the configuration (0-45° and all angles in between) desired.

The new D-3 variable inlet has been approved for use and is listed on the QPL. This option can be procured as Option N to the basic nozzle and it would replace either Option H or J.

## Features

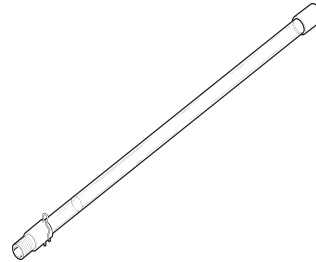
- Easy swiveling under all conditions. Swivel independent of quick disconnect (QD) coupling.
- Connects to 3-lug international standard aircraft adapter (MS24484 or MS29514)
- Lead-in ramps of stainless steel, not aluminum bronze, for longer life
- Self-adjusting pressure loaded nose seal. No mechanical adjustments or springs used. Leak free under extreme side loads, worn adapters and extreme temperatures.
- Nose seal can be changed with minimal disassembly. Arctic nose seal available.
- Positive mechanical interlock prevents fuel flow until nozzle is secured to aircraft adapter. Nozzle cannot be disconnected until closed.
- Flow control handle fully protected from damage. Two styles available.
- Flow control handles of high strength zinc-aluminum alloy
- Bicycle-type handles for ease of operation. Circular grip also available.
- Lightweight and rugged
- Modular construction. Optional inlet configurations include dry break disconnect and strainer ball valve.
- Hose end regulator and strainers optional
- Two bonding cables, vacuum breaker optional.
- Low pressure drop, under 12 psi (0.827 bar) at 600 USgpm (2,271 l/min)

## Special Tools

Specially designed tools are recommended for the maintenance of Model 64349 nozzles.

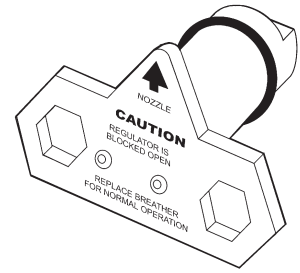
### 61607 Ball Tool

The ball removal and installation tool is utilized to collect and automatically count the balls used in the swivel joints of the nozzle. It is simple to use and assures that the proper installation is achieved. A minimum of two tools are required for the simplest of nozzle configurations (one for the collar swivel and one for the hose swivel). Three are required for a nozzle having a regulator or a ball valve.



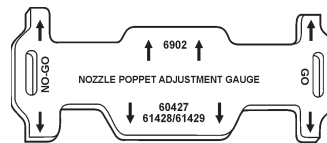
### 61656 Blockout Device

The blockout device is recommended for use when one defuels through a hose end regulator or it is necessary to check out the secondary pressure control device in a system. The blockout device does not introduce fuel into the ambient port of the regulator which can later become a dangerous spray during operation.

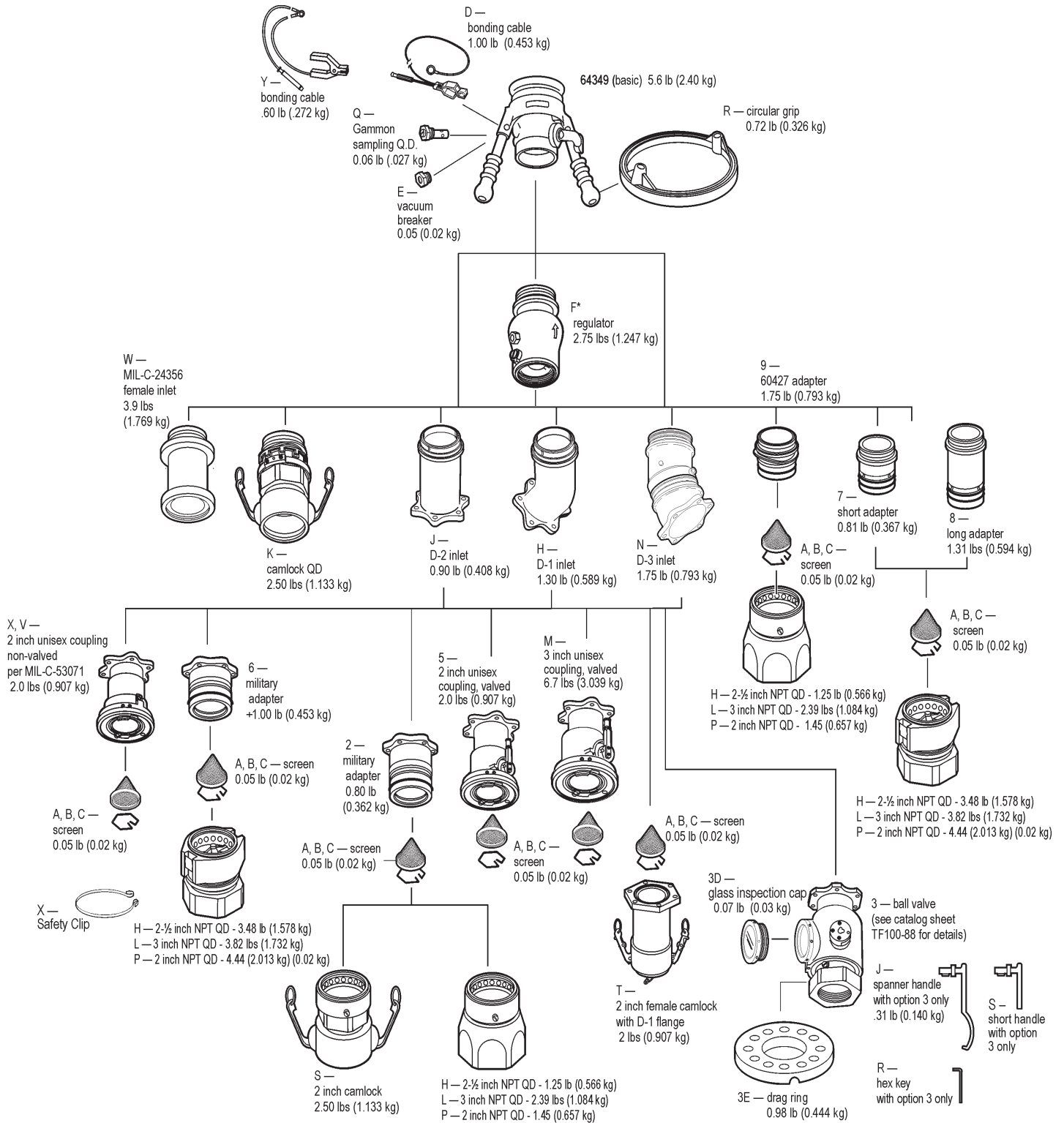


### 64000 Poppet Adjustment Gauge

This simple inexpensive gauge provides an accurate method of achieving the proper adjustment of the poppet of Model 64349 nozzle. The gauge can be used on all Eaton underwing nozzles except Models 64200 and 64250. Use gauge 64250ST-1 for these later style nozzles.



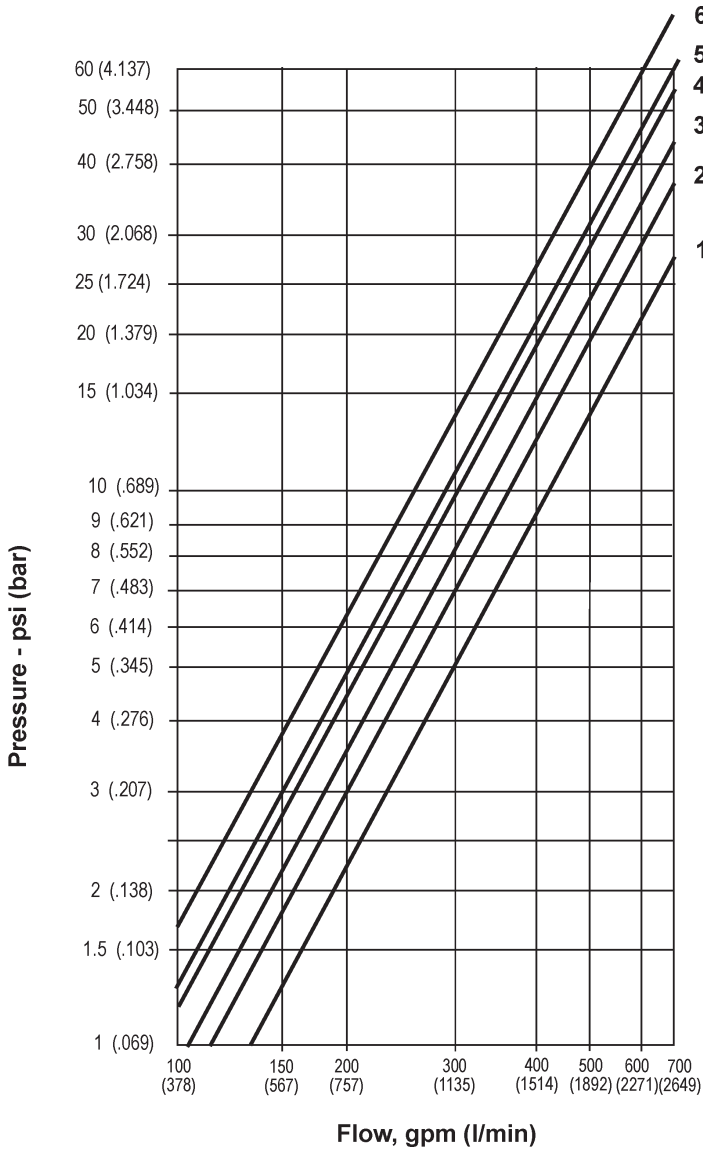
# Illustrated Options



# Technical Data

## Flow Characteristics

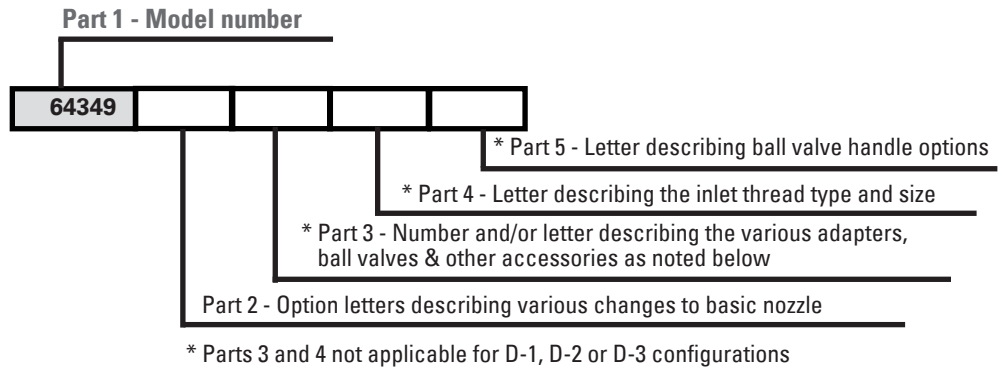
The graph below represents typical curves (when nozzle is attached to a standard aircraft adapter).



- Curve 1** 64349J D-2, 64349H D-1, 64349N D-3
- Curve 2** 64349H6H D-1 with 61154 Dry Break
- Curve 3** 643498H Basic nozzle with 61154 Dry Break
- Curve 4** 64349F5H6H D-1 with 55 psi (3.792 bar) Regulator and 61154 Dry Break
- Curve 5** 64349CH6H D-1 with 100-mesh strainer and 61154 Dry Break, or —  
64349F57H D-1 with 55 psi (3.792 bar) regulator and 61154 Dry Break
- Curve 6** 64349CF5H6H D-1 with 100-mesh strainer, 55 psi (3.792 bar) Regulator and 61154 Dry Break

# Ordering Data

The part number for a complete nozzle consists of five parts as illustrated (right).



## Part 2

The following options may be added as Part 2 of the part number as indicated above to order a unit to meet your requirements.

| Option | Description                                | Option | Description                              |
|--------|--|--------|--|
| *A     | Adds 40-mesh screen                        | H      | Adds 45° elbow — D-1 Style               |
| *B     | Adds 60-mesh screen                        | J      | Adds straight inlet — D-2 Style          |
| *C     | Adds 100-mesh screen                       | K      | Adds QD with 2-inch female camlock inlet |
| D      | Adds bonding cable                         | N      | Adds D-3 inlet coupling                  |
| E      | Adds vacuum breaker                        | Q      | Adds Gammon sampling QD                  |
| F1     | Adds 15 psi (1.034 bar) hose end regulator | R      | Adds circular handle grip                |
| F3     | Adds 35 psi (2.413 bar) hose end regulator | W      | Adds straight inlet per MIL-C-24356      |
| F4     | Adds 45 psi (3.103 bar) hose end regulator | **X    | Adds safety clip for dry break QD        |
| F5     | Adds 55 psi (3.792 bar) hose end regulator | Y      | Adds extended grounding cable            |
| F6     | Adds 48 psi (3.309 bar) hose end regulator | Z      | Arctic weather nozzle                    |

- \* Options A, B, and C only available with Options V or X or when a male half or a ball valve from Part 3 is specified
- \*\* Safety clip (p/n 210641) for the 61154 Dry Break QD is considered FOD (Foreign Object Debris) and not included on military nozzle assemblies; however, it can be added as a no cost option.

## Part 3

The configuration of the outlet is defined by adding the appropriate number or number and option letter from the table (right) in conjunction with the appropriate option letter from Part 4 below. The nozzle may terminate in an adapter half only, if desired. In this case leave Part 4 blank. To obtain a female half QD or dry break, or to complete the specification of the ball valve outlet, Part 4 must be completed.

| Option | Description  | Option | Description                                    |
|--------|--|--------|--|
| 2      | Adds military male adapter, disconnect               | 5      | Adds 2-inch unisex coupling, valved            |
| *3     | Adds Hose End Ball Valve (HEBV)                      | 6      | Adds military male adapter, dry break          |
| 3D     | HEBV with glass inspection cap                       | 7      | Adds dry break male adapter with Option F      |
| 3E     | HEBV with drag ring                                  | 8      | Adds dry break male adapter without Option F   |
| 3DE    | HEBV with glass inspection cap and drag ring         | **9    | Adds male adapter half to mate 60427 style QD  |
| 31     | HEBV with male QD assy                               | M      | Adds 3-inch unisex coupling, valved            |
| 31D    | HEBV with male QD assy and inspection cap            | V      | Adds 2-inch unisex coupling, non-valved, green |
| 31E    | HEBV with male QD assy and drag ring                 | X      | Adds unisex coupling, non-valved, tan          |
| 31DE   | HEBV with male QD assy, inspection cap and drag ring |        |  |

- \* The inlet size and configuration option from Part 4 must be included in the part number with Option 3 to achieve a completed nozzle and ball valve
- \*\* Not used with Options H, J or N from Part 1

## Part 4

One of the following letters must be included as Part 4 to specify the inlet thread size.

| Option | Description                | Option | Description  |
|--------|----------------------------|--------|--|
| H      | Inlet thread — 2½-inch NPT | S      | 2-inch camlock Inlet   |
| *L     | Inlet thread — 3-inch NPT  | T      | 2-inch female camlock with locking handle to D1 flange with camlock dust cap |
| P      | Inlet thread — 2-inch NPT  |        |  |

- \* 3 inch inlet threads not available with Option 3 HEBV
- Some of the above option letters may be duplicates of those found in Part 2. They must be accompanied by a number from Part 3 to be effective.

## Part 5

The following letters may be included as Part 5 to add handle options to the HEBV (Option 3 from Part 3).

| Option | Description         | Option | Description       |
|--------|---------------------|--------|-------------------|
| J      | Adds spanner handle | S      | Adds short handle |
| R      | Adds hex key        |        |                   |

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