



MAINTENANCE INSTRUCTION

MODERNIZATION RECOMMENDATION

PARAGON FUEL PUMP REPLACEMENT KITS

PURPOSE:

To inform EMD customers that Paragon motor driven fuel pump assemblies are now available for field application. The Paragon pumps will replace current fuel pump assemblies on specific models, and the existing pumps will no longer be available. Paragon pumps applied to new production and overhauled locomotives have demonstrated a significant improvement in reliability.

APPLICATION:

New integral fuel pump / motor assemblies are now available for the following EMD models:

SD70, SD70MAC, SD75, SD80MAC, SD90MAC (4300)

Export models and older domestic models – please consult the attached application conversion table.

REQUIRED MATERIAL:

Attached are tables which provide kit part numbers, schematics and procedures for application to the models listed above.

DISCUSSION:

All new production EMD locomotives are equipped with more reliable, integral, motor driven fuel pumps manufactured by Paragon. These pumps are now available for retrofit to existing field locomotives. As a result, **existing fuel pump assembly part numbers (both new and UTEX) for the applications listed above will be discontinued.**

There are 2 different pumps available, 1 for EUI equipped engines and 1 for MUI equipped engines. The pumps should not be interchanged between EUI and MUI applications.

- A high-pressure fuel pump (EMD # 10659917) (7.5 GPM) is required for EUI applications.
- A lower pressure fuel pump (EMD # 40077367) (7 GPM) is available for MUI applications.

The following table shows early Paragon kit numbers that have been discontinued:

| Customer | KIT # |
|----------|----------|
| BNSF | 40099623 |
| | 40099624 |
| | 40099625 |
| | 40099626 |
| CN | 40099627 |
| | 40099628 |
| | 40099624 |

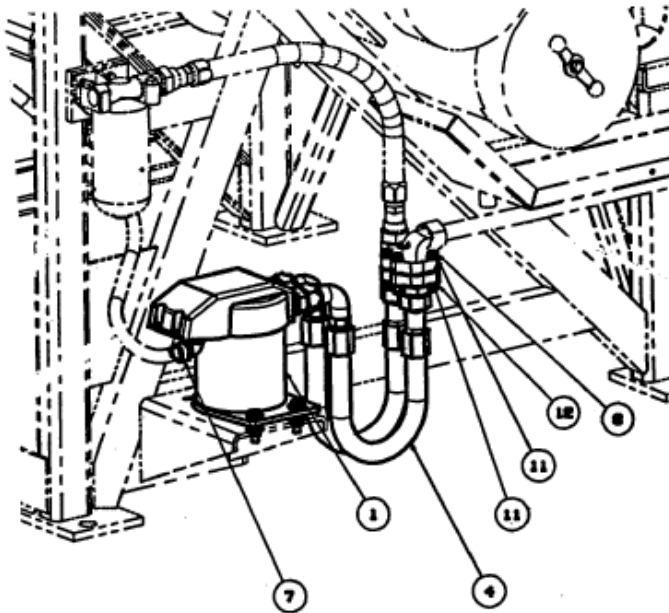
The following NEW and UTEX Dayton-Phoenix motor / Viking fuel pump assemblies have also been discontinued:

| FLOW RATE IN GPM | D/P-VIKING NEW PART # | D/P-VIKING UTEX PART # |
|------------------|-----------------------|------------------------|
| 6.0 | 8425609 (DC) | 40042770 |
| 6.0 | 40037370 (AC) | 40056748 |
| 7.5 | 40055868 (AC) | 40069489 |
| 7.5 | 10629326 (AC) | 40086985 |

Reference table providing appropriate conversion kit part numbers:

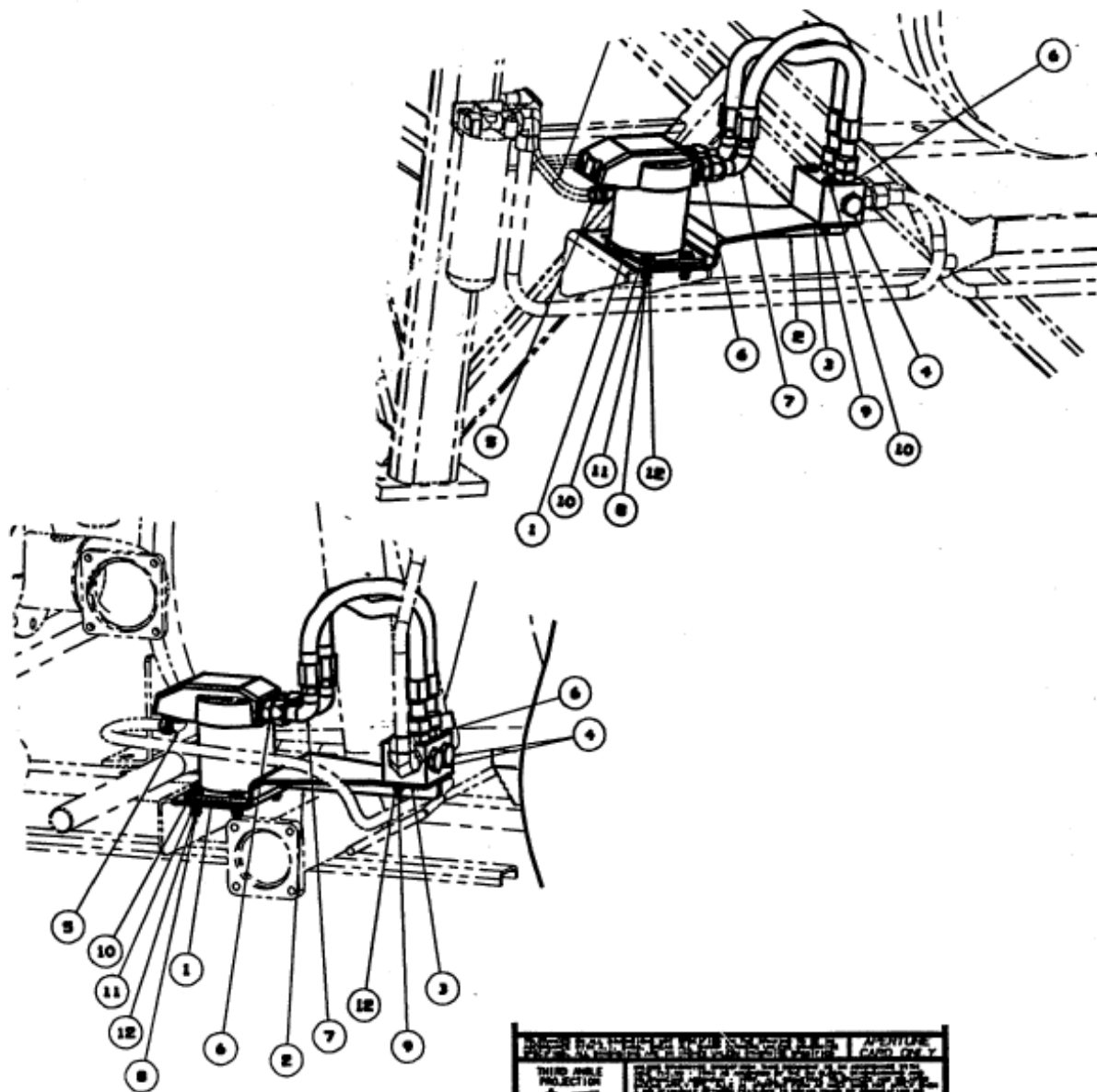
| ORIGINAL FLOW RATE IN GPM | MUI APPLICATION | | EUI APPLICATION | |
|---------------------------|-------------------|------------------------------|-------------------|------------------------------|
| | D/P-VIKING PART # | PARAGON (7.0 GPM) KIT PART # | D/P-VIKING PART # | PARAGON (7.5 GPM) KIT PART # |
| 6.0 | 8425609 (DC) | 40101822 | N/A | N/A |
| 6.0 | 40037370 (AC) | 40101822 | 40037370 (AC) | 40100344 |
| 7.5 | N/A | N/A | 40055868 (AC) | 40100388 |
| 7.5 | N/A | N/A | 10629326 (AC) | 40100388 |

The following schematics show the arrangement of fuel pump kits as applied on locomotives:



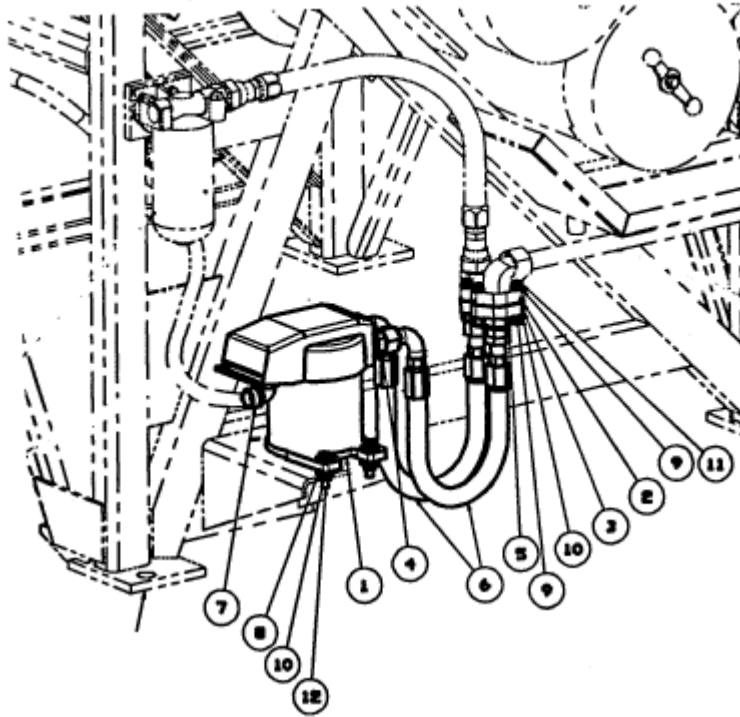
| NO. | MATL/NOTES | NAME OF PART | PART NO. | ITEM NO. |
|-----|------------|--------------------------|----------|----------|
| 7 | | NUT - 3/8-16 HEX | 120377 | 12 |
| 8 | | WASHER - 3/8 SPR LK | 120382 | 11 |
| 6 | | WASHER - 3/8 HARDENED | 10644629 | 10 |
| 3 | | BOLT - 3/8-16 HEX | 180128 | 9 |
| 4 | | BOLT - 3/8-16 HEX | 180132 | 8 |
| 1 | | ELBOW - 1/2 FCCM | 8240529 | 7 |
| 2 | | CONN - 1T - 1 1/165 ORFS | 40057291 | 6 |
| 2 | | CONN - 1T - 3/4PT | 40058791 | 5 |
| 2 | | HOSE ASM | 40100366 | 4 |
| 2 | | FLANGE - 3/4 PT | 8441843 | 3 |
| 2 | | BASKET | 40034626 | 2 |
| 1 | | PUMP - FUEL | 10659917 | 1 |

| | | | |
|--|--|---|--|
| THIRD ANGLE PROJECTION | | APERTURE | |
| GEOMETRIC TOLERANCING SYMBOLS □ FURTHER TOLERANCING REQUIRED ○ SURFACE TOLERANCING ○ LINE TOLERANCING ○ POINT TOLERANCING ○ POSITION TOLERANCING ○ PERPENDICULARITY ○ ANGULARITY ○ PROFILE OF A LINE ○ PROFILE OF A SURFACE ○ CIRCULAR RUNOUT ○ TOTAL RUNOUT | | FUEL PUMP APL PARAGON PUMP RETROFIT SERVICE 40100344 SHEET 1 OF 1 | |



| | | | |
|---------------------|----------------------|----------|----------|
| 5 | NUT-3/8-16 HEX | 120377 | 12 |
| 5 | WASHER-3/8 SPR LK | 120382 | 11 |
| 5 | WASHER-3/8 HARDENED | 10644829 | 10 |
| 2 | BOLT-3/8-16 HEX | 191163 | 9 |
| 3 | BOLT-3/8-16 HEX | 180128 | 8 |
| 2 | HOSE ASM | 40100366 | 7 |
| 4 | CONN-1T-1 1/165 ORFS | 40057291 | 6 |
| 1 | ELBOW-1/2 FCCM | 8240529 | 5 |
| 2 | PLUG-1 5/16 BOSS | 4005050 | 4 |
| 1 | PUMP MANIFOLD | 40100523 | 3 |
| 1 | BASE ASM | 40108050 | 2 |
| 1 | PUMP-FUEL | 10659917 | 1 |
| NO. MATL/NOTES RECD | NAME OF PART | PART NO. | ITEM NO. |

| THIRD ANGLE PROJECTION | | METRIC TOLERANCING SYMBOLS | |
|---|--|--|--|
| DIMENSION SYMBOLS DIMENSION LINE EXTENSION LINE CENTER LINE DIMENSION VALUE DIMENSION LINE ARROW DIMENSION LINE TAIL DIMENSION LINE HEAD DIMENSION LINE BODY DIMENSION LINE POINT DIMENSION LINE END DIMENSION LINE START DIMENSION LINE STOP DIMENSION LINE BREAK DIMENSION LINE OFFSET DIMENSION LINE SPACER DIMENSION LINE GUIDE DIMENSION LINE ALIGN DIMENSION LINE CENTER DIMENSION LINE BOUNDARY DIMENSION LINE EXTENSION DIMENSION LINE PROJECTION DIMENSION LINE TRAIL DIMENSION LINE LEADER DIMENSION LINE POINTER DIMENSION LINE ANCHOR DIMENSION LINE TIE DIMENSION LINE CATCH DIMENSION LINE RELEASE DIMENSION LINE CLEAR DIMENSION LINE MOVE DIMENSION LINE ROTATE DIMENSION LINE COPY DIMENSION LINE PASTE DIMENSION LINE DELETE DIMENSION LINE UNDO DIMENSION LINE REDO DIMENSION LINE ZOOM DIMENSION LINE PAN DIMENSION LINE SCROLL DIMENSION LINE FIT DIMENSION LINE HELP | DIMENSION VALUE DIMENSION LINE ARROW DIMENSION LINE TAIL DIMENSION LINE HEAD DIMENSION LINE BODY DIMENSION LINE POINT DIMENSION LINE END DIMENSION LINE START DIMENSION LINE BREAK DIMENSION LINE OFFSET DIMENSION LINE SPACER DIMENSION LINE GUIDE DIMENSION LINE ALIGN DIMENSION LINE CENTER DIMENSION LINE BOUNDARY DIMENSION LINE EXTENSION DIMENSION LINE PROJECTION DIMENSION LINE TRAIL DIMENSION LINE LEADER DIMENSION LINE POINTER DIMENSION LINE ANCHOR DIMENSION LINE TIE DIMENSION LINE CATCH DIMENSION LINE RELEASE DIMENSION LINE CLEAR DIMENSION LINE MOVE DIMENSION LINE ROTATE DIMENSION LINE COPY DIMENSION LINE PASTE DIMENSION LINE DELETE DIMENSION LINE UNDO DIMENSION LINE REDO DIMENSION LINE ZOOM DIMENSION LINE PAN DIMENSION LINE SCROLL DIMENSION LINE FIT DIMENSION LINE HELP | DIMENSION VALUE DIMENSION LINE ARROW DIMENSION LINE TAIL DIMENSION LINE HEAD DIMENSION LINE BODY DIMENSION LINE POINT DIMENSION LINE END DIMENSION LINE START DIMENSION LINE BREAK DIMENSION LINE OFFSET DIMENSION LINE SPACER DIMENSION LINE GUIDE DIMENSION LINE ALIGN DIMENSION LINE CENTER DIMENSION LINE BOUNDARY DIMENSION LINE EXTENSION DIMENSION LINE PROJECTION DIMENSION LINE TRAIL DIMENSION LINE LEADER DIMENSION LINE POINTER DIMENSION LINE ANCHOR DIMENSION LINE TIE DIMENSION LINE CATCH DIMENSION LINE RELEASE DIMENSION LINE CLEAR DIMENSION LINE MOVE DIMENSION LINE ROTATE DIMENSION LINE COPY DIMENSION LINE PASTE DIMENSION LINE DELETE DIMENSION LINE UNDO DIMENSION LINE REDO DIMENSION LINE ZOOM DIMENSION LINE PAN DIMENSION LINE SCROLL DIMENSION LINE FIT DIMENSION LINE HELP | DIMENSION VALUE DIMENSION LINE ARROW DIMENSION LINE TAIL DIMENSION LINE HEAD DIMENSION LINE BODY DIMENSION LINE POINT DIMENSION LINE END DIMENSION LINE START DIMENSION LINE BREAK DIMENSION LINE OFFSET DIMENSION LINE SPACER DIMENSION LINE GUIDE DIMENSION LINE ALIGN DIMENSION LINE CENTER DIMENSION LINE BOUNDARY DIMENSION LINE EXTENSION DIMENSION LINE PROJECTION DIMENSION LINE TRAIL DIMENSION LINE LEADER DIMENSION LINE POINTER DIMENSION LINE ANCHOR DIMENSION LINE TIE DIMENSION LINE CATCH DIMENSION LINE RELEASE DIMENSION LINE CLEAR DIMENSION LINE MOVE DIMENSION LINE ROTATE DIMENSION LINE COPY DIMENSION LINE PASTE DIMENSION LINE DELETE DIMENSION LINE UNDO DIMENSION LINE REDO DIMENSION LINE ZOOM DIMENSION LINE PAN DIMENSION LINE SCROLL DIMENSION LINE FIT DIMENSION LINE HELP |
| HEDONENHUS GREGOL FUEL PUMP APL PARSON PUMP RETROFIT SERVICE 40100388 SHEET 1 OF 1 | | US BOLID / 36 FORMAT | |



| 3 | BOLT-3/8-16 HEX | 180128 | 12 | |
|-----|---------------------|--------------|----------|----------|
| 4 | BOLT-3/8-16 HEX | 180132 | 11 | |
| 7 | NUT-3/8-16 HEX | 120377 | 10 | |
| 8 | WASHER-3/8 SPR LK | 1E0382 | 9 | |
| 6 | WASHER-3/8 HARDENED | 10644829 | 8 | |
| 1 | ELBOW-1/2 FCOM | 8240529 | 7 | |
| 2 | HOSE ASM | 40082832 | 6 | |
| 2 | CONN-3/4 T-3/4 PT | 40075210 | 5 | |
| 2 | CONN-3/4GRFS-1/2PT | 40079340 | 4 | |
| 2 | FLANGE-3/4 PT | 8441843 | 3 | |
| 2 | BASKET | 40034626 | 2 | |
| 1 | PUMP-FUEL | 40077367 | 1 | |
| NO. | MATL/NOTES | NAME OF PART | PART NO. | ITEM NO. |

| APERTURE | | CARD 024 V | |
|------------------------|--|---|--|
| THIRD ANGLE PROJECTION | | GEOMETRIC TOLERANCING SYMBOLS □ PLAN / SURFACE ◊ RADIUS ◊ RADIUS ⊥ PERPENDICULAR ⊥ PERPENDICULAR ⊥ PERPENDICULAR ⊙ HOLE POSITION ⊙ HOLE POSITION ⊙ HOLE POSITION ⊙ LEAD SYMBOL, POSITION LINE ⊙ PROFILE OF A LINE ⊙ LEAD SYMBOL, POSITION LINE ⊙ PROFILE OF A SURFACE ⊙ ENLARGED TOLERANCE ZONE ⊙ DATA REPRESENTATION | |
| 45.00 | | HEDDINGHAUS 07E02 FUEL PUMP APL P/DAISON PUMP RETROFIT | |
| NO. 1 | | 5070M TIER 1 40101822 SHEET 1 OF 1 | |

US BOLID / 36 FORMAT

PROCEDURE:

This Modernization Recommendation is to be conducted at time of pump-motor assembly replacement due to:

- pump failure
- motor failure
- locomotive overhaul

Follow all Railroad and Local Shop policies and safety rules regarding tools, work practices and blue flagging.

1. Ensure fuel pump circuit breaker is open and tagged-out.
2. Remove supply hose / line to pump. Remove discharge hose/ line from pump. Disconnect wiring at junction box attached to motor. Remove original configuration pump-motor assembly.
3. Fasten the Paragon Pump's universal mounting plate to the locomotive's original fuel pump bracket.
4. Apply hoses per the attached schematics.
5. Connect conduit wiring at the motor. Inverter is polarity independent.
6. Close the fuel pump breaker, and inspect all fuel fittings for leaks while confirming pump operation.