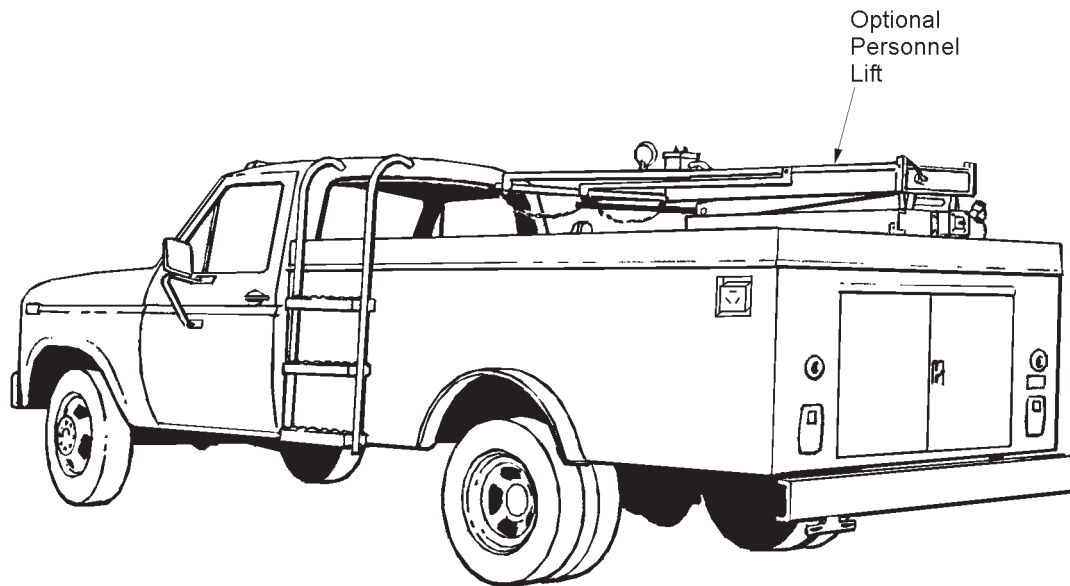


WATER SERVICE TRUCK

OPERATION, MAINTENANCE AND PARTS MANUAL



MODEL TWS-402

NMC-WOLLARD, Inc.

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INTRODUCTION

Congratulations on the purchase of your new TWS-402 from NMC-Wollard, Inc. With its optional equipment this is the simplest, most flexible system on the market today. With proper operation and preventative maintenance it will last for years.



This SAFETY ALERT SYMBOL indicates important safety messages in the manual. When you see this symbol, be alert to the possibility of PERSONAL INJURY and carefully read the message that follows.

⚠ WARNING

Never operate without all covers, shields and guards in place. Body, hair or clothing can become entangled in exposed, moving parts and can cause serious injury or death.

Some covers and guards have been removed for illustrative/photographic purposes only in this manual.

The Warranty appears in the front of this book. The order number and serial number are recorded on page 31 of this section. These numbers are for your reference and for proper identification of your machine by NMC-Wollard, Inc.

For information on ordering repair parts, refer to the Repair Parts chapter at the back of this book.

You are urged to study this manual and follow the instructions carefully. Your efforts will be repaid in better operation and service as well as a savings in time and repair expense. Failure to read and understand the machine or the system could lead to serious injury. If you do not understand the instructions in this manual contact the manufacturer.

This supercedes all previous published instructions.

When reading this manual, if a figure or paragraph *outside* the current section is referred to, it will be identified by Chapter-Section-Figure Number or Chapter-Section-Paragraph.

Example:

Figure 2-2-4.....Chapter 2-Section 2-Figure 4
2-2-1.4.....Chapter 2-Section 2-Paragraph 1.4

If figures or paragraphs from the current section are referred, the chapter and section may not be referenced.

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INTRODUCTION

This manual is available on CD-ROM P/N 301256.

Keep a copy of your NMC-Wollard, Inc. manuals on your computer or CD-ROM! You will be able to print pages and adjust page view anywhere between 25%-400%. Our view-only manuals contain hypertext links in the tables of contents, so by mouse-clicking on a table of contents entry, the page containing that item will automatically be displayed.

Requirements (minimum): PC with Windows 95 or newer, 486 processor (586 recommended), 8MB RAM, VGA monitor, mouse.

For availability and pricing, contact NMC-Wollard, Inc. customer service at:

Phone (715) 835-3151

Fax (715) 835-6625

Email custserv@nmc-wollard.com

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2 YEAR LIMITED WARRANTY

NMC-Wollard, Inc.

NMC-Wollard, Inc. warrants to the original owner that all components of the equipment are free from defects in material and workmanship under normal use and service for 24 months or 2,000 hours, whichever comes first, from the date of delivery.

This warranty provides for NMC-Wollard, Inc. equipment components that fail because of defects in material or workmanship during the warranty period, without charge to the owner for parts or labor. The owner must provide prompt notice of the defect and allow a reasonable time for replacement or repair.

This warranty applies only to parts manufactured by NMC-Wollard, Inc. Components installed on NMC-Wollard, Inc. equipment but not manufactured by NMC-Wollard, Inc. shall be covered under the original manufacturer's warranty. NMC-Wollard, Inc. will assist in administering all such warranties, with the exception of tires, battery, and other expendable parts, for which the owner will be required to deal directly with the original manufacturer for warranty service. Neither tune-ups, normal maintenance and repair or replacement of expendable parts (such as oil, lubricants, belts, filters, tires, battery, etc.) are covered by this warranty.

This warranty does not cover damage resulting from carelessness or neglect; accidents, fire, or other casualties; improper repair, operation, transportation, or storage; or failure to provide necessary or appropriate maintenance. This warranty does not cover deterioration or failure caused by chemicals, falling objects, dirt and sand, or excessive heat or moisture. The NMC-Wollard, Inc. equipment must be maintained according to the instructions provided with it or this warranty may be considered void. Warranted components must be replaced with parts manufactured or approved by NMC-Wollard, Inc. Warranty determination will be made after NMC-Wollard, Inc. inspects failed part.

NMC-Wollard, Inc. is not liable for damage or injury resulting from improper installation, use, abuse, inability to use or misapplication of NMC-Wollard, Inc. equipment, nor is NMC-Wollard, Inc. liable for damage resulting from equipment repaired or modified by persons not authorized by NMC-Wollard, Inc. NMC-Wollard, Inc. does not warrant any part or product to meet local, municipal, state, provincial, or national laws or regulations.

This Limited Warranty is in lieu of all other warranties, whether express, implied, or statutory. No other express warranty is given or authorized by NMC-Wollard, Inc. NMC-Wollard, Inc. expressly disclaims any implied warranty of merchantability or fitness for a particular purpose or otherwise. NMC-Wollard, Inc. shall not be liable for loss of use of equipment, loss of time, loss of business, or for any other incidental, or consequential damages. No authorized NMC-Wollard, Inc. representative has the right to change or modify this warranty in any respect.

This warranty is non-transferable.

TO OBTAIN WARRANTY SERVICE

Warranty service can be obtained by contacting NMC-Wollard, Inc. If you need warranty service, contact NMC-Wollard, Inc., 2021 Truax Blvd., Eau Claire, WI. 54703, (Phone 715 835-3151) (Fax 715 835-6625)

What to do when you receive a new unit.

Make sure that you have received all equipment, including manuals and registration card. Return the registration card immediately.
Inspect the unit for any transportation damage, including broken glass, leaks, or loose wires or belts.

What to do when you discover a possible warranty problem.

Call NMC-Wollard, Inc. (715-835-3151). We will require the serial number, number of hours on the unit, and a description of the problem. You will be given a warranty authorization number and assistance in troubleshooting.

IMPORTANT!

Clear and immediate communication with the factory is the key to obtaining a satisfactory and timely resolution of your warranty problem.

Every warranty situation is different and so there are no hard rules. We will work with your maintenance personnel and service managers to equitably resolve all claims.

What to do after warranty problem has been resolved.

Complete and return the warranty claim form within 10 days. Place the assigned warranty authorization number we gave you when you first called us with the problem on your claim.

Return defective parts immediately. Your claim cannot be processed until all defective parts have been returned to NMC-Wollard, Inc. Identify returned parts with the assigned warranty authorization number.

What labor rate and time should be used?

Labor rate is reviewed annually. If you do not have an established rate, call NMC-Wollard, Inc. We do not publish a rate book; instead, we have accumulated average times for repairs. We will authorize repair time once we have approved the repair. If unforeseen circumstances cause a significantly greater repair time than originally approved, please contact us before submitting your claim.

INTRODUCTION

TABLE OF CONTENTS

INTRODUCTION	2
2 YEAR LIMITED WARRANTY	4
TABLE OF CONTENTS.....	7
REVISION RECORD	18
REVISION HIGHLIGHTS	19
PAGE EFFECTIVITY	25
CONFIGURATION.....	31
EFFECTIVITY CODE	33

CHAPTER 1 GENERAL INFORMATION & OPERATING INSTRUCTIONS TABLE OF CONTENTS

1. DESCRIPTION	1
1.1 PRODUCT SAFETY	1
1.2 SAFETY DECALS	2
1.3 GENERAL SAFETY PRECAUTIONS	4
1.4 EQUIPMENT DESCRIPTION	6
1.4.1 Intended Usage	6
1.4.2 Description Of The Water Service Truck	6
1.4.3 Chassis (Cab and Engine)	6
1.4.4 Engine	7
1.4.5 Hydraulic System	7
1.4.6 Optional Mico Brake	10
1.4.7 Electrical Systems	10
1.4.8. Potable Water Dispensing System	12
1.4.9 Personnel Lift	14
2. OPERATION	1
2.1 DAILY INSPECTION	1
2.2 FILLING THE POTABLE WATER TANK	2
2.3 DISPENSING POTABLE WATER TO AIRCRAFT	3
2.4 DISPENSING POTABLE WATER (WITH OPTIONAL TOP MOUNTED LIFT)	3
2.5 DISPENSING POTABLE WATER (WITH OPTIONAL BUMPER MOUNTED LIFT)	4
2.6 HEATER OPERATION	5
2.7 OPERATION OF OPTIONAL MICO LEVER BRAKE	6
2.8 OPTIONAL REAR BUMPER LIFT	6
2.8.1 Lift Control	7
2.8.2 Maintenance Control Rear Bumper Mounted Lift	8
2.8.3 Ground Control	9
2.8.4 Emergency Lower Control	9
2.8.5 Interlock Shutdown	10
3. SPECIFICATIONS AND CAPABILITIES	1
3.1 96/97	1
3.1.1 Dimensions	1
3.1.2 Personnel lift - Fully up	1
3.1.3 Weights	1
3.1.4 Capacities	1
3.2 99/00	3
3.2.1 Dimensions	3

3.2.2 Personnel lift - Fully up	3
3.2.3 Weights	3
3.2.4 Capacities	3

CHAPTER 2 MAINTENANCE

TABLE OF CONTENTS

1. SERVICING	1
1.1 PREVENTIVE MAINTENANCE	1
1.3 BOLT TIGHTENING DATA.....	2
1.2 AS REQUIRED	3
1.2.1 Truck Engine and Chassis	3
1.2.2 Draining The Water Tank	3
1.2.3 Cleaning the Water Tank Interior	3
1.3 WEEKLY	4
1.3.1 Check Hydraulic Reservoir	4
1.4 EVERY 100 HOURS.....	4
1.4.1 Clean Y-Strainer.....	4
1.4.2 Clean Side Panels, Treads, and Deck	4
1.4.3 Inspect Water Truck	4
1.5 EVERY 250 HOURS.....	5
1.5.1 Change Hydraulic Oil	5
1.5.2 Lubricate Lift Assembly.....	5
1.6 YEARLY	6
1.6.1 Change Hydraulic Oil.....	6
1.7 ADJUSTMENTS	7
1.7.1 Hydraulic Pump Drive Belt.....	7
1.7.2 Throttle Advance For Gas Engines With Advance Cylinder (EFF SN.....	7
0363-)	7
1.7.3 Throttle Advance For Gas Engines With Potentiometer (EFF SN 0364+)....	7
1.7.4 Hydraulic Pressure Setting	8
1.7.5 Maintenance Safety for Optional Rear Bumper Lift	9
1.7.6 Potable Water Dispensing System	10
2 TROUBLE SHOOTING	1
2.1 PROBABLE CAUSE AND REMEDIES - HYDRAULIC.....	1
2.2 SCHEMATICS	3
3 REMOVAL AND INSTALLATION	1
3.1 GENERAL.....	1
3.2 STRUCTURAL COMPONENTS.....	2
3.3 ELECTRICAL COMPONENTS REMOVAL AND INSTALLATION	2
3.4 HYDRAULIC COMPONENTS REMOVAL AND INSTALLATION	2
3.5 PERSONNEL LIFT	3
3.5.1 Removal and Installation	3
3.5.2 Hydraulic Cylinder.....	5
3.6 HYDRAULIC SYSTEM – SPECIAL INSTRUCTIONS	5
3.7 HYDRAULIC SYSTEM SAFETY	6
3.8 FORD 6.0L DIESEL CLUTCH PUMP KIT INSTALLATION	7
3.9 F350 V8/GAS CLUTCH PUMP INSTALLATION	11
3.10 DEWEZE, FORD 5.4L, 2007+ CLUTCH PUMP INSTALLATION	13
3.11 ADDITIONAL DEWEZE CLUTCH PUMP KITS	13

4 REPAIRS	1
4.1 HYDRAULIC PUMP DRIVE BELT	1
4.2 FORD AUXILIARY POWERTRAIN CONTROL (APC) MODULE	1
4.2.1 96/97 7.3L Diesel	1
4.2.2 1999-Future 7.3L Diesel	4
4.3 PUMP IN PARK ONLY OPTION	10

CHAPTER 3 OVERHAUL/MAJOR REPAIRS

TABLE OF CONTENTS

1 GENERAL REPAIRS 1

1.1 GENERAL INFORMATION..... 1

1.2 TRUCK CHASSIS..... 1

CHAPTER 4 REPAIR PARTS

TABLE OF CONTENTS

SECTION 1 HOW TO USE THE REPAIR PARTS CHAPTER	1
SECTION 2 LIST OF VENDORS	1
SECTION 3 NUMERICAL PART NUMBER LIST	1
SECTION 4 ILLUSTRATED PARTS LIST	1
305813 WORKLIGHT RELOCATION, OPTION	247
ALARM, BACKUP OPTION	114
ANTI-SKID TOP DECK, OPTION	236
ASSEMBLY, LED FLOODLIGHT, W/ FIXED BASE	243
ASSEMBLY, LED FLOODLIGHT, W/ SWIVEL BASE	244
BEACON, ROTATING, AMBER, OPTION	60
BLOCK HEATER OPTION, DIESEL, 96/97	142
BLOCK HEATER OPTION, GAS, 96/97	144
BLOCK HEATER OPTION, GAS, 99 & LATER	140
BODY MARKERS, OPTIONAL	56
BODY, OUTER, OPTION	164
BRAKE LOCK, MICO LEVER, OPTION	58
BREAKAWAY KAISER COUPLING OPTION	116
BUMPER, HEAVY DUTY, OPTION, F350, 1999-2000	145
BUMPER, HEAVY DUTY, OPTION, F350, 2000+	146
BUMPER, HEAVY DUTY, OPTION, F350, 2009+	147
BUMPER, HEAVY DUTY, OPTION, F350, 2010+	148
BUMPER, RUBBER, OPTION	150
BUMPER W/ PLATFORM, REAR OPTION	149
CAB FLOOR PLATES, OPTION, 99 & LATER	180
CAB ROTATING BEACON, OPTION	198
CLUTCH, MAG, 8-GROOVE	30
COUPLING, BREAKAWAY, A/C END, OPTION	116
CYLINDER ASSEMBLY LIFT	96
DECALS, US AIR OPTION	182
DOOR LOCK DEACTIVATION OPTION, 96/97	188
DOOR LOCK DEACTIVATION OPTION, 99 & LATER	190
DRAIN, REMOTE, OPTION, 1.5"	184
ELECTRICAL ASSEMBLY, 96/97	46
ELECTRICAL ASSEMBLY, 99 & LATER	48
ELECTRICAL ASSEMBLY, 402 SIDE DOORS	50
FILL PORT WITH BACKFLOW OPTION	40
FIRE EXTINGUISHER, OPTION	172
FORD 6.0L DIESEL CLUTCH PUMP KIT	208
FUEL TANK FILL PIPE, 96/97	52
GATE PLATE, OPT, DNR F350, 99 & LATER	202
GOVERNOR, F350 GAS, 2005 & LATER	222
GOVERNOR, 350/V8 GAS, OPTION 02 & LATER	152
GOVERNOR OPTION F350, 96/97	154
GOVERNOR WITH FUEL INJECTION, OPTION, 99 & LATER	152

GRIPSTRUT, OPTION, 96/97	170
GRIPSTRUT, TOP REAR, OPTION	166
GRIPSTRUT, TOP REAR, W/ LT OPTION	168
HEAT, 402, 120V & 12V OPTION	108
HEAT OPTION, 120V/240 & 12V	104
HEAT OPTION, 120V/240 & 12V	106
HEAT TRACE, DRAIN OPTION	110
HEAT WIRING AND HOSES ONLY OPTION	112
HIGH WATER TEMP SHUTDOWN W/ LOW OIL SHUTDOWN OPT, DIESEL, F350/F450, 99 & LATER	160
HOSE, REAR EXIT, OPTION	172
HOURLY METER INSTALLATION OPTION, DIESEL, 99 & LATER	102
HOUR METER OPTION, 95 & EARLIER	98
HOUR METER OPTION, GAS, 96/97	100
HYDRAULIC INSTALLATION W/O LIFT OPTION	26
HYDRAULIC INSTALLATION W/O LIFT OPTION	28
HYDRAULIC INSTALLATION W/ REAR BUMPER MOUNTED LIFT	90
HYDRAULIC INSTALLATION W/ REAR TOP MOUNTED PERSONNEL LIFT	74
HYDRAULIC INST. W/ SIDE COMPARTMENT DOORS AND W/O LIFT	8
HYDRAULIC INST. W/ SIDE COMPARTMENT DOORS AND W/O LIFT	10
LED WORKLITE, OPTION	242
LIFT, REAR BUMPER OPTION, BUMPER	84
LIFT, REAR BUMPER OPTION, CONTROL BOX ASSEMBLY	80
LIFT, REAR BUMPER OPTION, ELECTRIC INSTALLATION	76
LIFT, REAR BUMPER OPTION, ELECTRIC INSTALLATION	78
LIFT, REAR BUMPER OPTION, GROUND CONTROL BOX	82
LIFT, REAR BUMPER OPTION, LOWER SCISSORS SUB ASSEMBLY	88
LIFT, REAR BUMPER OPTION, UPPER SCISSORS SUB ASSEMBLY	86
LIGHTS, BACK-UP, OPTION	64
LIGHTS, CANADA, TWS 402 OPTION	186
LOW OIL PRESSURE SHUTDOWN OPTION, GAS 96/97	134
LOW OIL PRESSURE SHUTDOWN OPTION, GAS, 99 & LATER	136
LOW OIL SHUTDOWN, GAS/DSL	224
LOW OIL SHUTDOWN OPTION, DIESEL F350/F450, 99 & LATER	138
MORSE CONTROL, OPTION - 97, DIESEL	226
MORSE CONTROL OPTION, 1997 CHASSIS AND LATER	120
MORSE CONTROL OPTION, 1997 CHASSIS AND LATER	122
MORSE CONTROL OPTION, DNR, 99-2000	126
MORSE CONTROL OPTION, DNR, 99 & LATER	124
MORSE CONTROL OPTION, THROUGH 1997 CHASSIS	118
NEUTRAL INTERLOCK, 2ND, F350/F450, GAS/DIESEL, 99 & LATER	192
OPTION, WHEEL CHOCKS W/ TRAY, MID SIZE	245
PAD, BRAKE PEDAL, GRIPSTRUT, F350, OPTION	246
PARKING BRAKE INTERLOCK, OPTION	200
PARKING BRAKE, OPTION	200
PERSONNEL LIFT ASSEMBLY, TOP MOUNTED	66
PERSONNEL LIFT, TOP MOUNTED, ELECTRICAL ASSEMBLY	72

PERSONNEL LIFT, TOP MOUNTED, HANDRAIL ASSEMBLY	68
PERSONNEL LIFT, TOP MOUNTED, LIFT SCISSORS ASSEMBLY	70
PLACARD ASSEMBLY	54
PREPARATION, ENGINE 96/97	14
PREPARATION, TRUCK 96/97	12
PUMP IN PARK ONLY, OPTION KIT	210
PUMP KIT, F350, 6.4 DIESEL, 2008 & LATER	232
PUMP KIT, F350, 6.7 DIESEL, 2012	234
PUMP KIT W/CLUTCH ,F350, GAS, 2009	216
PUMP KIT W/CLUTCH ,F350, GAS, 2011	218
PUMP KIT W/ CLUTCH, F350, V8 GAS 2007+	240
PUMP KIT W/ CLUTCH, F350, V8 GAS 2014+	220
PUSH BUTTON STATION, WATER PUMP OPTION	162
REEL, REAR ACCESS OPTION	174
SHUTOFF, NOZZLE END, 3/4" HOSE OPTION	176
SKID KIT OPTION	194
STAIR, REAR, OPTION	178
STARTER PROTECTION, F350/F450, DIESEL, 1999 & LATER OPTION	132
STARTER PROTECTION OPTION, GAS 99 & LATER	130
STARTER PROTECTION OPTION, GAS & DIESEL, 96/97	128
SWITCH, IGNITION, OPTION, COLE HERSEE, 99 & LATER	158
SWITCH, IGNITION, OPTION, COLE HERSEE, 1997 & EARLIER	156
TANK VACUUM RELIEF, OPTION	236
TANK, VENT/FILL COUPLING OPTION	196
TOW HOOKS, FRONT, OPTION	204
TRUCK CHASSIS, F350, V10 GAS - 02 & LATER	206
TRUCK PREP, F350, 6.0 DIESEL, 2005 & LATER	228
TRUCK PREP, F350, 99 & LATER	20
TRUCK PREP, F350 DIESEL, 99 & LATER	18
TRUCK PREP, F350 GAS, 99 & LATER	16
TRUCK PREP, F350, V8 GAS	24
TRUCK PREP, F350, V8 GAS, 2005 & LATER	212
TRUCK PREP, F350, V8 GAS, 2005 & LATER	214
TRUCK PREP, F350, V8 GAS 2007+	238
TRUCK PREP, F350 V10 GAS, 99 TO 01	22
WATER PLUMBING INSTALLATION	32
WATER PLUMBING INST. WITH PUSH BUTTON PUMP START OPT.	42
WATER PLUMBING INST. W/PUSH BUTTON, PUMP START OPT, & FILL PORT OPT 305345	36
WATER TRUCK ASSEMBLY WITH REAR COMPARTMENT DOORS	2
WATER TRUCK ASSEMBLY WITH SIDE COMPARTMENT DOORS	6

CHAPTER 5 MANUFACTURERS INFORMATION

UNITED TECHNOLOGIES AUTOMOTIVE	2
ADVANCE HYDRAULICS CO.	8
DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2007+	10
308703 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2008	14
309061 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2009	18
309516 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2011	23
309993 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2014	27
307377 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2003	33
308713 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2008	37
309634 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2012	40

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REVISION RECORD

Rev No.	Issue Date	Date Inserted	Initial
1	01/06/97	01/06/97	NMC-Wollard
2	11/03/99	11/03/99	NMC-Wollard
3	03/16/00	03/16/00	NMC-Wollard
4	11/01/00	11/01/00	NMC-Wollard
5	04/30/01	04/30/01	NMC-Wollard
6	02/28/03	02/28/03	NMC-Wollard
7	08/31/03	08/31/03	NMC-Wollard
8	02/28/04	02/28/04	NMC-Wollard
9	08/31/05	08/31/05	NMC-Wollard
10	02/28/06	02/28/06	NMC-Wollard
11	08/31/06	08/31/06	NMC-Wollard
12	08/31/07	08/31/07	NMC-Wollard
13	08/31/08	08/31/08	NMC-Wollard
14	02/15/14	02/15/14	NMC-Wollard
15	04/15/14	04/15/14	NMC-Wollard
16	08/20/14	08/20/14	NMC-Wollard
17	12/01/14	12/01/14	NMC-Wollard

REVISION HIGHLIGHTS

TO: HOLDERS OF NMC-Wollard, Inc. OPERATION AND MAINTENANCE MANUAL
number 301236, TWS-402 WATER SERVICE TRUCK

Pages that have been revised are outlined below, together with highlights of the revision. Please delete and/or replace the affected pages and enter Revision No. and date to the Revision Record Page.

REVISION NO. 3 DATED 3/16/00

Chapter/Section/Page No.	Description of Changes	Effectivity
1/20-21	Option for Mico Lever Brake Added	
4/32-36	Options added	

REVISION NO. 4 DATED 11/01/00

Chapter/Section/Page No.	Description of Changes	Effectivity
All chapters/all pages	Formatted manual to SAE Specifications	SN 250+

REVISION NO. 5 DATED 4/30/01

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/7-22	TOC Updated, updated information	all
2/TOC/1-2	Updated	all
2/1/2	Updated Bolt Tightening Data	all
2/4/8-12	Added installation instructions for APCM Kit	all
4/TOC/1-4	Updated	all
4/1/1-2	Miscellaneous update	all
4/2/1-2	Cage Code update	all
4/3/1-6	Parts index updated	all
4/4/all pages	Miscellaneous part number revisions throughout	all
	Added part #306325	B
	Added effectivity	C

REVISION NO. 6 DATED 2/28/03

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro\1-28	TOC Revised, pgs renumbered. Record of Rev#6, Rev 6 added, Page Eff updated	all

C1/3/1-2	Axle ratio updated	all
C2/1/9-10	Revised Potable Dispensing System instructions.	all
C2/2/4-9	Schematics added	all
C4/TOC/1-3	TOC update	all
C4/3/1-6	Parts index updated	all
C4/4/4,5,16,18,20,21,22,23,44,45,46-47,76-77,126-129,188-200	16391 added, item 7 added to illustration. 99+ chg'd to 99-01, illustration added, parts revised 19854 asm. Updated. Artwork revisions and updated part numbers. Added 306992 Beacon, 303809 Parking Brake Option, 306303 opt. D-N-R Plate, 303794 opt. Tow Hooks, 307127 F350, V10 Gas	all

REVISION NO. 7

DATED 08/31/03

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/TOC/10,11,13-15,18,21,22-25	TOC Revised, Record of Rev#7, Rev 7 added, Page Eff updated	all
C2/TOC/1-2	TOC updated	all
C2/2/37-38	306659 added, 19854 added	all
C2/3/6-10	Clutch Pump Kit added	all
C4/TOC/1-3	TOC updated	all
C4/3/1-5	Parts index updated	all
C4/4/8,9,45,50,51,70,71,144,145,198,199,200-202	Part Nos updated. Part nos. 307120, 307123, 307125 added. 306521 added. 306659 added. Clutch pump kit added.	all

REVISION NO. 8

DATED 02/28/04

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/TOC/10,11,13-15,18,22-30	TOC updated, Rev 8 added, Pg eff updated, pgs renumber	all
2/TOC/1/2	TOC updated	all
2/1/7-12	Revised Throttle Adv. For Gas Eng. W/ Adv. Cyl, Add Throttle Adv. For Gas Eng. W/Potentiometer, pgs renumbered.	all
2/4/4-13	Updated 1999-Future 7.3L Diesel Programming Instructions, Pump inPark Option added, Pages renumbered.	all
4/TOC/1-4	TOC updated	all
4/3/1-6	Parts index updated	all
4/4/3,16,19,31,62-63,71,202-204	305476 deleted, Update 305590 ills., Add Part #306334, hose chgd to 264", Update 8543, 3.288 chngd to 201048 & 201047 chngd to 303249, 306837 added	all

REVISION NO. 9

DATED 08/31/05

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/ 13-15.18,22. 24-27.30	Updated chap. 4 TOC. Rev 9 added, Pg eff updated. Added eff. E & F.	all
2/2/15.24-25.39-40.	Add Eff. Added ref for 2005. Added 305624 schem for 2005. Add 307538 schem.	all
2/3/10-12.	Added gas clutch pump installation.	all
4/TOC/1-4.	TOC updated	all
4/3/1-6.	Parts index updated	all
4/4/72-73.178.204-207.208-209.210-211.212-213.	Add update for SN 363. Update diagram for 2005. Add 307393. Add 307521. Add 307538. Add 307543	all

REVISION NO. 10

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Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/ 13-15.18,22. 24-27.30	Updated chap. 4 TOC. Rev 9 added, Pg eff updated. Added eff. G & H.	all
4/TOC/1-4.	TOC updated	all
4/3/1-6.	Parts index updated	all
4/4/17.214-218	Add Eff G. Add 30706.	all

REVISION NO. 11

DATED 08/31/06

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/ 18,22. 24-27.	Rev 11 added, Pg eff updated.	all
2/1/2	Update SAE info for Bolt Torque Chart	all
4/3/1-6.	Parts index updated	all
4/4/50-51.84	Update Decals And Placards, add 306792. Switch Keys 5 & 6.	all

REVISION NO. 12

DATED 08/31/07

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/ 13-15.18,23. 24-27.	Update Chap 4 TOC. Rev 12 added. Pg eff updated.	all
2/2/42.	Add Throttle Advance Schem 2005+.	all
4/3/1-6.	Parts index updated	all
4/4/3.141.204.215.218.	Chg 1308.36 to 307355. Add 308649. Update throttle adv schematic. Add 8946.2 & 10384.49. Add 306785.	all

REVISION NO. 13 08/31/08

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/all pages	Update per ANSI Z535.6. Add Rev 13. Update TOC's. Update Eff.	all
1/all pages	Update per ANSI Z535.6.	all
2/all pages	Update per ANSI Z535.6.	all

2/3/13	DewEze, Ford 5.4L, 2005+ Clutch Pump added	I
3/all pages	Update per ANSI Z535.6.	all
4/1/1-4	TOC updated	all
4/3/1-6	Parts index updated	all
4/4/219-222	Truck prep added	I
5/1.10-13	Update TOC. DewEze, Ford 5.4L, 2005+ Clutch Pump added	I

REVISION NO. 14

DATED 02/14/15

Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/15,18,22-23,24-26	Update Ch. 4 TOC, Page Eff updated	all
4/1/4	TOC updated	all
4/3/1-6	Parts index updated	all
4/4/9, 89	Added part no for Eff I on several items	I
4/4/28-32, 34-35	Added item 80 to figure 13 and 14, added part no 309988	I
4/4/61	Added LED light to backup lights option	all
4/4/95	Updated hourmeter part no, added decal part no	I
4/4/136-141	Updated Heavy Duty Bumper options for 2000, 2009, 2010	all
4/4/177	Added ball valve part no 309970 to tank drain option	I
4/4/224-228	Added LED Floodlite options and wheel chock options	all

REVISION NO.15		DATED 04/15/14
Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/14-15,18,22-24,26,31	Chp 4 TOC, Rev Record, Rev Highlights, Page Eff Updated , Eff. Code	all
1/1/8	Fig. 1 Updated	all
2/TOC/1-2	Updated	all
2/1/8,9	Deleted cylinder rod adjust step on page 8, Fig. 2 updated	all
2/2/13,14	Add ill. for 2013 wiring	J
2/2/20,21	Fig 18,19 updated	all
2/2/42,43	Add throttle adv. diesel, 2009,2010,2011	all
2/244,45	Updated Gas 2005 and later, add 2009-14	all
2/3/12,13	SN363 was Prior to 718, SN 364 was after 718, added section 3.11	all
4/1/1-3	TOC updated	all
4/2/2	Add DEWEZE	all
4/3/1-6	Parts index updated	all
4/4/8,9	Updated Ill. and parts	I
4/4/26-29	Add Ill. for hydraulic systems	J
4/4/35	Add 3.1682,309988	all
4/4/47	Add 309980 Option	all
4/4/51	Add 308910,30911,308912	all
4/4/55	Add 303339	all
4/4/70,71	Remove Item 50, 305451	all
4/4/77	Add item 21, 2.3093	all
4/4/91,93,97	Add 305538. 305713, 3.1926 was 1.9008, item 6 page 91 was 8797.44	all
4/4/94,95	Add illustrations for hose routing and pumps	all
4/4/106,107	Add 303652 Option	all
4/4/117	Add 307295 Option	all
4/4/119	Add 302257 Option	all
4/4/197	Coupling option not available	all
4/4/201	Add 309956 Option	all
4/4/213	Add 309995,309993	all
4/4/212,217	Add 309061	all
4/4/213, 219	Add 309516,309993	all
4/4/233	Add 308713	all
4/4/229	Add 309634	all
4/4/237	Add 309182 Option, 306786 is reference	all
4/4/244	309981 was 309982, add 308955,308953	all
4/4/247	Add 305813	
5/TOC	Updated	all
5/14-48	Add DEWEZE clutch pump kits	all

REVISION NO.16		DATED 08/20/14
Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/18,24,25,27,28,29	Rev Record, Rev Highlights, Page Eff Updated	all
4/3/6	Parts index updated	
4/4/47,49,51,77,133,137,139,163,213,239	2.3648 relay, for service order SB502	all

REVISION NO.17		DATED 12/01/14
Chapter/Section/Page No.	Description of Changes	Effectivity
Intro/18,24,25,26,28	Rev Record, Rev Highlights, Page Eff Updated	all
2/2/34,35	Updated illustrations	E
4/3/6	Parts index updated	
4/4/128,129,130,131	2.3828 relay, for service order SB505, Added 310050 relay	D E

PAGE EFFECTIVITY

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>	<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
Cover	1	08/31/08	1-1	13	08/31/08
Introduction	2	08/31/08	1-1	14	08/31/08
Introduction	3	08/31/08	1-2	1	08/31/08
Limited Warranty	4	08/31/08	1-2	2	08/31/08
Limited Warranty	5	08/31/08	1-2	3	08/31/08
Limited Warranty	6	08/31/08	1-2	4	08/31/08
Table Of Contents	7	04/15/14	1-2	5	08/31/08
Table Of Contents	8	04/15/14	1-2	6	08/31/08
Table Of Contents	9	04/15/14	1-2	7	08/31/08
Table Of Contents	10	04/15/14	1-2	8	08/31/08
Table Of Contents	11	04/15/14	1-2	9	08/31/08
Table Of Contents	12	08/31/08	1-2	10	08/31/08
Table Of Contents	13	04/15/14	1-3	1	08/31/08
Table Of Contents	14	04/15/14	1-3	2	08/31/08
Table Of Contents	15	04/15/14	1-3	3	08/31/08
Table Of Contents	16	08/31/08	1-3	4	08/31/08
Table Of Contents	17	08/31/08	2-TOC	1	04/15/14
Revision Record	18	08/20/14	2-TOC	2	04/15/14
Revision Highlights	19	08/31/08	2-1	1	08/31/08
Revision Highlights	20	08/31/08	2-1	2	08/31/06
Revision Highlights	21	08/31/08	2-1	3	08/31/08
Revision Highlights	22	04/15/14	2-1	4	08/31/08
Revision Highlights	23	04/15/14	2-1	5	08/31/08
Revision Highlights	24	08/20/14	2-1	6	08/31/08
Page Effectivity	25	08/20/14	2-1	7	08/31/08
Page Effectivity	26	12/01/14	2-1	8	08/31/08
Page Effectivity	27	08/20/14	2-1	9	04/15/14
Page Effectivity	28	12/01/14	2-1	10	08/31/08
Page Effectivity	29	08/20/14	2-1	11	08/31/08
Page Effectivity	30	04/15/14	2-1	12	08/31/08
Configuration	31	04/15/14	2-2	1	08/31/08
Configuration	32	04/15/14	2-2	2	08/31/08
Effectivity Code	33	04/15/14	2-2	3	08/31/08
Effectivity Code	34	04/15/14	2-2	4	08/31/08
1-TOC	1	08/31/08	2-2	5	08/31/08
1-TOC	2	08/31/08	2-2	6	08/31/08
1-1	1	08/31/08	2-2	7	08/31/08
1-1	2	08/31/08	2-2	8	08/31/08
1-1	3	08/31/08	2-2	9	08/31/08
1-1	4	08/31/08	2-2	10	08/31/08
1-1	5	08/31/08	2-2	11	08/31/08
1-1	6	08/31/08	2-2	12	04/15/14
1-1	7	08/31/08	2-2	13	04/15/14
1-1	8	04/15/14	2-2	14	04/15/04
1-1	9	08/31/08	2-2	15	04/15/14
1-1	10	08/31/08	2-2	16	04/15/14
1-1	11	08/31/08	2-2	17	04/15/14
1-1	12	08/31/08	2-2	18	08/31/08

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>	<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
2-2	19	08/31/08	2-4	5	08/31/08
2-2	20	08/31/08	2-4	6	08/31/08
2-2	21	08/31/08	2-4	7	08/31/08
2-2	22	08/31/08	2-4	8	08/31/08
2-2	23	08/31/08	2-4	9	08/31/08
2-2	24	04/15/14	2-4	10	08/31/08
2-2	25	04/15/14	2-4	11	01/10/13
2-2	26	08/31/08	2-4	12	08/31/08
2-2	27	11/01/00	3-TOC	1	08/31/08
2-2	28	08/31/08	3-TOC	2	08/31/08
2-2	29	08/31/08	3-1	1	08/31/08
2-2	30	08/31/08	3-1	2	08/31/08
2-2	31	08/31/08	4-TOC	1	04/15/14
2-2	32	08/31/08	4-TOC	2	04/15/14
2-2	33	08/31/08	4-TOC	3	04/15/14
2-2	34	12/01/14	4-TOC	4	04/15/14
2-2	35	12/01/14	4-1	1	08/31/07
2-2	36	08/31/08	4-1	2	08/31/07
2-2	37	08/31/08	4-2	1	04/30/01
2-2	38	08/31/08	4-2	2	04/15/14
2-2	39	08/31/08	4-3	1	04/15/14
2-2	40	08/31/08	4-3	2	04/15/14
2-2	41	08/31/08	4-3	3	04/15/14
2-2	42	08/31/08	4-3	4	04/15/14
2-2	43	08/31/08	4-3	5	04/15/14
2-2	44	04/15/14	4-3	6	12/01/14
2-2	45	08/31/08	4-4	1	04/30/01
2-2	46	04/15/14	4-4	2	04/30/01
2-2	47	04/15/14	4-4	3	08/31/07
2-2	48	04/15/14	4-4	4	02/28/06
2-2	49	04/15/14	4-4	5	02/28/06
2-2	50	04/15/14	4-4	6	04/30/01
2-3	1	08/31/08	4-4	7	04/30/01
2-3	2	08/31/08	4-4	8	04/15/14
2-3	3	08/31/08	4-4	9	04/15/14
2-3	4	08/31/08	4-4	10	04/15/14
2-3	5	08/31/08	4-4	11	04/15/14
2-3	6	08/31/08	4-4	12	04/30/01
2-3	7	08/31/08	4-4	13	04/30/01
2-3	8	08/31/08	4-4	14	04/30/01
2-3	9	08/31/08	4-4	15	04/30/01
2-3	10	08/31/08	4-4	16	04/30/01
2-3	11	08/31/08	4-4	17	04/30/01
2-3	12	04/15/14	4-4	18	02/28/04
2-3	13	04/15/14	4-4	19	02/28/06
2-3	14	08/31/08	4-4	20	02/28/06
2-4	1	11/01/00	4-4	21	02/28/04
2-4	2	11/01/00	4-4	22	02/28/06
2-4	3	11/01/00	4-4	23	02/28/06
2-4	4	08/31/08			

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
4-4	24	02/28/06
4-4	25	02/28/06
4-4	26	04/15/14
4-4	27	04/15/14
4-4	28	04/15/14
4-4	29	04/15/14
4-4	30	04/30/01
4-4	31	04/30/01
4-4	32	02/15/14
4-4	33	04/30/01
4-4	34	02/15/14
4-4	35	02/15/14
4-4	36	02/15/14
4-4	37	04/30/01
4-4	38	02/15/14
4-4	39	02/15/14
4-4	40	04/30/01
4-4	41	04/30/01
4-4	42	04/15/14
4-4	43	04/30/01
4-4	44	04/15/14
4-4	45	04/15/14
4-4	46	04/30/01
4-4	47	08/20/14
4-4	48	02/28/03
4-4	49	08/20/14
4-4	50	02/28/03
4-4	51	08/20/14
4-4	52	04/30/01
4-4	53	04/30/01
4-4	54	04/15/14
4-4	55	04/15/14
4-4	56	04/30/01
4-4	57	04/30/01
4-4	58	04/30/01
4-4	59	04/30/01
4-4	60	04/30/01
4-4	61	04/30/01
4-4	62	04/30/01
4-4	63	04/30/01
4-4	64	04/30/01
4-4	65	02/15/14
4-4	66	02/28/04
4-4	67	02/28/04
4-4	68	04/30/01
4-4	69	04/30/01
4-4	70	04/30/01
4-4	71	04/30/01
4-4	72	04/30/01

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
4-4	73	04/30/01
4-4	74	08/31/03
4-4	75	02/28/04
4-4	76	04/15/14
4-4	77	08/20/14
4-4	78	04/31/01
4-4	79	04/15/14
4-4	80	02/28/03
4-4	81	02/28/03
4-4	82	04/30/01
4-4	83	04/30/01
4-4	84	04/30/01
4-4	85	04/30/01
4-4	86	04/30/01
4-4	87	04/30/01
4-4	88	08/31/06
4-4	89	04/30/01
4-4	90	04/30/01
4-4	91	04/15/14
4-4	92	04/30/01
4-4	93	02/15/14
4-4	94	04/15/14
4-4	95	04/15/14
4-4	96	04/15/14
4-4	97	04/15/14
4-4	98	04/30/01
4-4	99	04/30/01
4-4	100	04/30/01
4-4	101	04/30/01
4-4	102	04/15/14
4-4	103	02/15/14
4-4	104	04/30/01
4-4	105	04/30/01
4-4	106	04/15/14
4-4	107	04/15/14
4-4	108	04/30/01
4-4	109	04/30/01
4-4	110	04/30/01
4-4	111	04/30/01
4-4	112	04/30/01
4-4	113	04/30/01
4-4	114	04/30/01
4-4	115	04/30/01
4-4	116	04/15/14
4-4	117	04/15/14
4-4	118	04/30/01
4-4	119	04/15/14
4-4	120	04/30/01
4-4	121	04/30/01

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>	<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
4-4	122	04/30/01	4-4	171	04/30/01
4-4	123	04/30/01	4-4	172	04/30/01
4-4	124	04/30/01	4-4	173	04/30/01
4-4	125	04/30/01	4-4	174	04/30/01
4-4	126	04/30/01	4-4	175	04/30/01
4-4	127	04/30/01	4-4	176	04/30/01
4-4	128	12/01/14	4-4	177	04/30/01
4-4	129	12/01/14	4-4	178	04/30/01
4-4	130	12/01/14	4-4	179	04/30/01
4-4	131	12/01/14	4-4	180	04/30/01
4-4	132	04/30/01	4-4	181	04/30/01
4-4	133	08/20/14	4-4	182	04/30/01
4-4	134	02/28/03	4-4	183	04/30/01
4-4	135	02/28/03	4-4	184	04/30/01
4-4	136	02/28/03	4-4	185	02/15/14
4-4	137	08/20/14	4-4	186	08/31/05
4-4	138	04/30/01	4-4	187	04/30/01
4-4	139	08/20/14	4-4	188	04/30/01
4-4	140	04/30/01	4-4	189	04/30/01
4-4	141	04/30/01	4-4	190	04/30/01
4-4	142	04/30/01	4-4	191	04/30/01
4-4	143	04/30/01	4-4	192	04/30/01
4-4	144	02/15/14	4-4	193	04/30/01
4-4	145	02/15/14	4-4	194	04/30/01
4-4	146	02/15/14	4-4	195	04/30/01
4-4	147	02/15/14	4-4	196	02/28/03
4-4	148	02/15/14	4-4	197	02/28/03
4-4	149	02/15/14	4-4	198	02/28/03
4-4	150	04/30/01	4-4	199	02/28/03
4-4	151	04/30/01	4-4	200	04/15/14
4-4	152	08/31/03	4-4	201	04/15/14
4-4	153	08/31/03	4-4	202	02/28/03
4-4	154	04/30/01	4-4	203	02/28/03
4-4	155	04/30/01	4-4	204	02/28/03
4-4	156	04/30/01	4-4	205	02/28/03
4-4	157	04/30/01	4-4	206	08/31/03
4-4	158	04/30/01	4-4	207	08/31/03
4-4	159	04/30/01	4-4	208	08/31/03
4-4	160	04/30/01	4-4	209	08/31/03
4-4	161	04/30/01	4-4	210	02/28/04
4-4	162	04/30/01	4-4	211	02/28/04
4-4	163	08/20/14	4-4	212	08/31/05
4-4	164	04/30/01	4-4	213	08/20/14
4-4	165	04/30/01	4-4	214	08/31/05
4-4	166	04/30/01	4-4	215	08/31/05
4-4	167	04/30/01	4-4	216	04/15/14
4-4	168	04/30/01	4-4	217	04/15/14
4-4	169	04/30/01	4-4	218	04/15/14
4-4	170	04/30/01	4-4	219	04/15/14

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
4-4	220	04/15/14
4-4	221	04/15/14
4-4	222	08/31/05
4-4	223	08/31/05
4-4	224	08/31/07
4-4	225	08/31/08
4-4	226	08/31/08
4-4	227	08/31/08
4-4	228	02/28/06
4-4	229	08/31/08
4-4	230	02/28/06
4-4	231	02/28/06
4-4	232	04/15/14
4-4	233	04/15/14
4-4	234	04/15/14
4-4	235	04/15/14
4-4	236	04/15/14
4-4	237	04/15/14
4-4	238	08/31/08
4-4	239	08/20/14
4-4	240	08/31/08
4-4	241	08/31/08
4-4	242	04/15/14
4-4	243	04/15/14
4-4	244	04/15/14
4-4	245	04/15/14
4-4	246	04/15/14
4-4	247	04/15/14
4-4	248	04/15/14
5-TOC	1	04/15/14
5-1	2	11/01/00
5-1	3	11/01/00
5-1	4	11/01/00
5-1	5	11/01/00
5-1	6	11/01/00
5-1	7	11/01/00
5-1	8	11/01/00
5-1	9	11/01/00
5-1	10	11/01/00
5-1	11	08/31/08
5-1	12	08/31/08
5-1	13	08/31/08
5-1	14	08/31/08
5-1	15	04/15/14
5-1	16	04/15/14
5-1	17	04/15/14
5-1	18	04/15/14

<u>Chapter/Section</u>	<u>Page</u>	<u>Date</u>
5-1	19	04/15/14
5-1	20	04/15/14
5-1	21	04/15/14
5-1	22	04/15/14
5-1	23	04/15/14
5-1	24	04/15/14
5-1	25	04/15/14
5-1	26	04/15/14
5-1	27	04/15/14
5-1	28	04/15/14
5-1	29	04/15/14
5-1	30	04/15/14
5-1	31	04/15/14
5-1	32	04/15/14
5-1	33	04/15/14
5-1	34	04/15/14
5-1	35	04/15/14
5-1	36	04/15/14
5-1	37	04/15/14
5-1	38	04/15/14
5-1	39	04/15/14
5-1	40	04/15/14
5-1	41	04/15/14
5-1	42	04/15/14
5-1	43	04/15/14
5-1	44	04/15/14

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CONFIGURATION

The NMC-Wollard, Inc. sales order number for this unit is

_____.

The serial number placard is fixed to this unit for your convenience, record the serial number (or range of numbers for multiple orders) below.

Serial Number(s):

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Both the sales order and serial numbers are required for proper identification by NMC-Wollard, Inc. whenever you call for service parts or other technical support.

The unit shipped with this operator's manual was equipped with the items indicated on the following available options listing.

- | | | |
|--------------------------|--------|--|
| ☐ | 8543 | Option, Personnel Lift Assembly, Top Mounted |
| ☐ | 8807 | Option, Lt, Beacon, Amber |
| ☐ | 8928 | Option, Door Lock Deactivation |
| ☐ | 12207W | Option, Heat, 120V & 12V |
| ☐ | 12209 | Option, Heat, 120V & 12V |
| ☐ | 13371 | Option, Gripstrut |
| ☐ | 13372 | Option, Bumper, Rubber |
| ☐ | 13657 | Option, Bumper w/Platform, Rear |
| ☐ | 14493 | Option, Reel Rear Access |
| ☐ | 16499 | Option, Alarm, Back-Up |
| ☐ | 17576 | Option, Breakaway Kaiser Coupling |
| ☐ | 17697 | Option, Heat Trace, Drain |
| ☐ | 17698 | Option, Drain, Remote, 1.5" |
| ☐ | 17945 | Option, Shutoff, Nozzle Engine, 3/4" Hose |
| ☐ | 19251 | Option, Fire Extinguisher |
| ☐ | 19535 | Option, Skid Kit |
| ☐ | 19741 | Option, Morse Control |
| ☐ | 300812 | Option, Governor F350, 96/97 |
| ☐ | 300857 | Option, Hour Meter F350 V10 |
| ☐ | 300858 | Option, Starter Protection, Gas & Diesel 96/97 |
| ☐ | 301097 | Option, Block Heater, Gas, 96/97 |

- ☐ 301298-1 Option, Low Oil Pressure Shutdown, Gas & Diesel 96/97
- ☐ 301298-2 Option, Low Oil Pressure Shutdown, Gas 99 & Later
- ☐ 301299 Option, Low Oil Shutdown, Diesel, F350/F450, 99 & Later
- ☐ 302257 Option, Morse Control
- ☐ 303046 Option, Neutral Interlock, 2nd, F350/F450, Gas/Diesel, 99 & Later
- ☐ 303652 Option, Heat 220V & 12V
- ☐ 303739 Option, Block Heater, Gas, 99 & Later
- ☐ 303741 Option, Switch, Ignition, Cole Hersee, 99 & Later
- ☐ 303810 Option, Morse Control, DNRP, 99 & Later
- ☐ 303814 Option, Bumper, Heavy Duty, 99 & Later
- ☐ 303826 Option, Governor w/Fuel Injection, 99 & Later
- ☐ 304162 Option, Starter Protection, F350/F450, Diesel, 99 & Later
- ☐ 304188 Option, Lights, Canada, TWS 402
- ☐ 304676 Option, Heat Wiring & Hoses Only
- ☐ 305213 Option, High Water Temp Shutdown w/Low Oil Shutdown, Diesel, F350/F450, 99 & Later
- ☐ 305216 Option, Hour Meter Installation, Diesel, 99 & Later
- ☐ 305259 Option, Flashing Beacon
- ☐ 305267 Option, Lights, Back-Up
- ☐ 305280 Option, Body Markers
- ☐ 305302 Option, Hose, Rear Exit
- ☐ 305305 Option, Stair, Rear
- ☐ 305318 Option, Push Button Station, Water Pump
- ☐ 305345 Option, Fill Port w/Backflow
- ☐ 305360 Option, Body, Outer, SS
- ☐ 305365 Option, Cab Floor Plates, 99 & Later
- ☐ 305371 Option, Heat, 402, 120V & 12V
- ☐ 305374 Option, Gripstrut, Top Rear
- ☐ 305380 Option, Decals, US Air
- ☐ 305382 Option, Gripstrut, Top Rear w/Lt, 402
- ☐ 305383 Option, Brake Lock, Mico Lever
- ☐ 305449 Option, Lift, Rear Bumper
- ☐ 305588 Option, F350, Diesel, TWS 402
- ☐ 305813 Option, Work Light Reloaction
- ☐ 306325 Option, Morse Control DNR
- ☐ 306837 Pump In Park Only, Option Kit
- ☐ 306992 Option, Beacon, Cab Rotation
- ☐ 307295 Coupling Breakaway, Option
- ☐ 309182 Anti-Skid Top Deck, Option
- ☐ 309714 Option, Hourmeter
- ☐ 309980 LED Bulb for 2.3956, Option
- ☐ 309956 Park Brake Interlock, Option

EFFECTIVITY CODE

This manual is effective on units having the following serial numbers

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CHAPTER 1 GENERAL INFORMATION AND OPERATING INSTRUCTIONS

1. DESCRIPTION	1
1.1 PRODUCT SAFETY	1
1.2 SAFETY DECALS	2
1.3 GENERAL SAFETY PRECAUTIONS	4
1.4 EQUIPMENT DESCRIPTIONS	6
1.4.1 Intended Usage	6
1.4.2 Description Of The Water Service Truck	6
1.4.3 Chassis (Cab and Engine)	6
1.4.4 Engine	7
1.4.5 Hydraulic System	7
1.4.6 Optional Mico Brake	10
1.4.7 Electrical Systems	10
1.4.8. Potable Water Dispensing System	12
1.4.9 Personnel Lift	14
2. OPERATION	1
2.1 DAILY INSPECTION	1
2.2 FILLING THE POTABLE WATER TANK	2
2.3 DISPENSING POTABLE WATER TO AIRCRAFT	3
2.4 DISPENSING POTABLE WATER (WITH OPTIONAL TOP MOUNTED LIFT)	3
2.5 DISPENSING POTABLE WATER (WITH OPTIONAL BUMPER MOUNTED LIFT)	4
2.6 HEATER OPERATION	5
2.7 OPERATION OF OPTIONAL MICO LEVER BRAKE	6
2.8 OPTIONAL REAR BUMPER LIFT	6
2.8.1 Lift Control	7
2.8.2 Maintenance Control Rear Bumper Mounted Lift	8
2.8.3 Ground Control	9
2.8.4 Emergency Lower Control	9
2.8.5 Interlock Shutdown	10
3. SPECIFICATIONS AND CAPABILITIES	1
3.1 96/97	1
3.1.1 Dimensions	1
3.1.2 Personnel lift - Fully up	1
3.1.3 Weights	1
3.1.4 Capacities	1
3.2 99/00	3
3.2.1 Dimensions	3

3.2.2 Personnel lift - Fully up

3.2.3 Weights

3.2.4 Capacities

3

3

3

1. DESCRIPTION

1.1 PRODUCT SAFETY

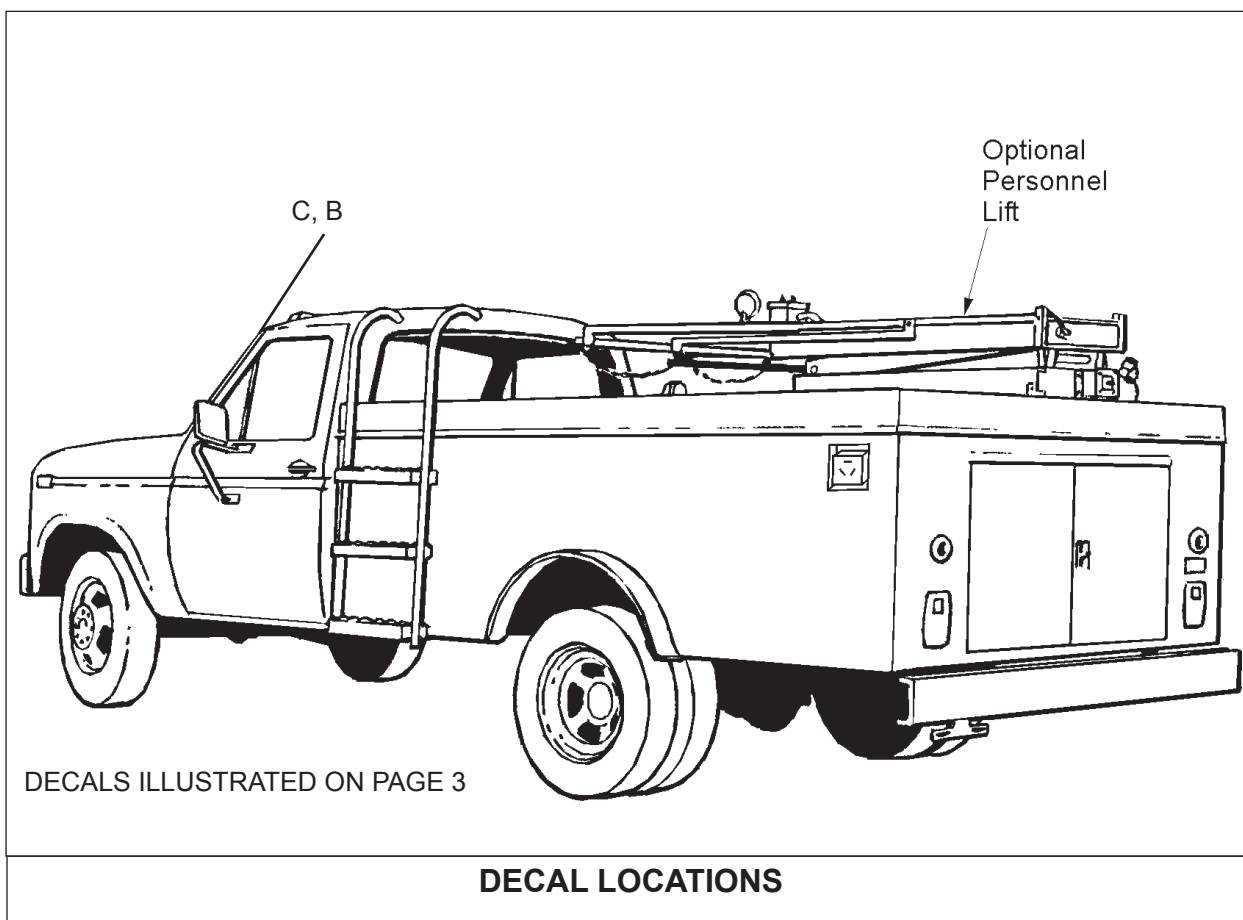
A brief description of signal words that may be used in this manual:

⚠ DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

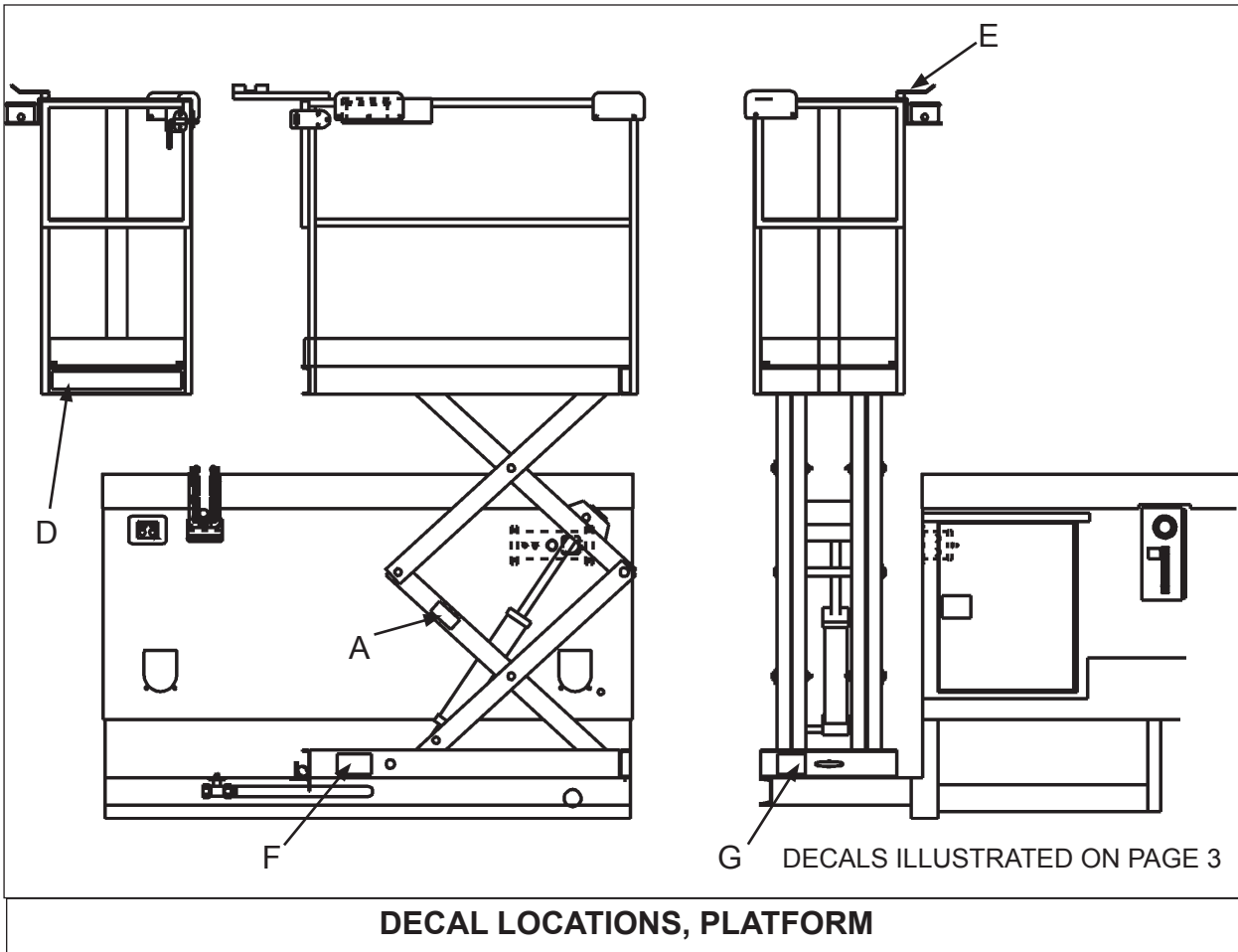
⚠ WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE! Used to address practices not related to personal injury.



⚠ CAUTION For your protection, read all safety decals on the machine and in this manual. Replace any missing or illegible decals by ordering the part numbers shown on the safety decals page.



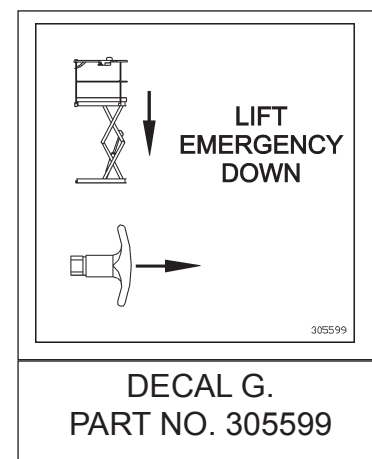
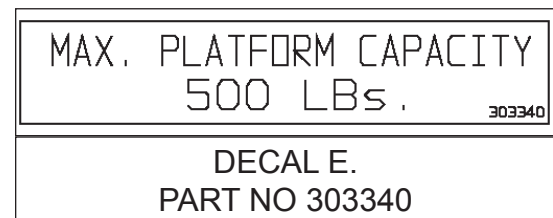
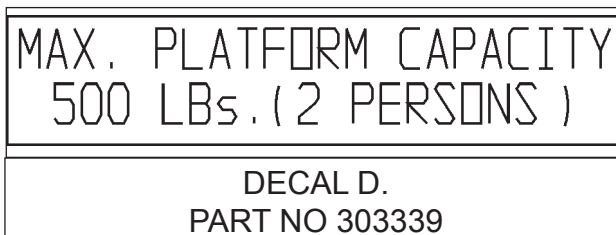
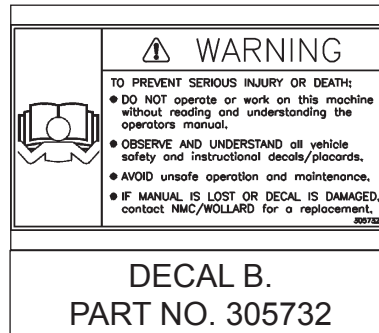
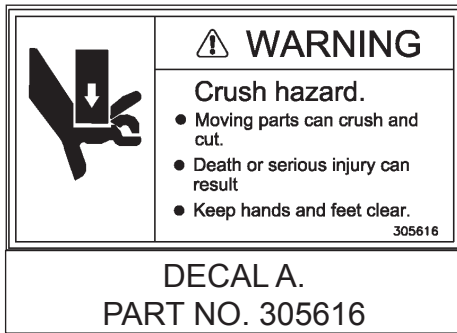
1.2 SAFETY DECALS

SAFETY SIGN CARE

- Keep Safety Signs Clean And Legible At All Times.
- Replace Safety Signs That Are Missing Or Have Become Illegible.
- Replaced Parts That Displayed A Safety Sign Should Also Display The Current Sign.
- Safety Signs Are Available From Your Dealer.

HOW TO INSTALL SAFETY SIGNS

- Be Sure That The Installation Area Is Clean And Dry.
- Remove The Smallest Portion Of The Split Backing Paper.
- Align The Decal Over The Specified Area And Carefully Press The Small Portion With The Exposed Adhesive Backing In Place.
- Remove Second Backing And Press Remaining Decal In Place



1.3 GENERAL SAFETY PRECAUTIONS

All personnel who will handle, install, use or service this machine are required to read and understand the recommended practices and safety precautions in this manual. If there is a question that can not be answered satisfactorily by a supervisor, contact the Customer Service Department at NMC-Wollard, Inc. There are inherent hazards associated with the operation and servicing of this machine. For your protection please read and understand the following precautions before operating or servicing this machine.

DANGER

- Never approach overhead power lines or cables with any part of your machine. Contact with or getting close to any power lines or cables can result in electrocution.
- Fuel vapors create fire and explosion hazards. Do not allow open flame, smoking materials or other potential ignition sources near fuel or fuel system.

WARNING

- Never operate without all covers, shields and guards in place. Body, hair or clothing can become entangled in exposed, moving parts and can cause serious injury or death.
- Keep hands, loose clothing, long hair and loose jewelry away from moving parts. You may become entangled in moving parts that can cause serious injury or death.
- Perform lockout/tagout procedures before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could cause serious injury or death.
- Use seat belts, approved headgear, eye protection and other protective equipment as required by federal, state, local or employer regulations.
- Do not operate or service this machine while under the influence of any drugs or alcohol.
- Do not indulge in stunt driving or other reckless operation.
- Limit travel speed. Ground conditions, congestion, slope, location of personnel and other factors increase risk of collision or injury to personnel.
- Operator must be present while this machine is in use.
- California Proposition 65 Warning: Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
- To minimize risk of serious injury or death, follow these hydraulic servicing precautions:
 - Follow all necessary lockout/tagout procedures.

- Hydraulic systems have residual, stored pressure. Relieve all pressure from the hydraulic system before servicing.
- Allow fluid to cool before working on system.
- Hydraulic fluid escaping under pressure can have sufficient force to enter eyes and penetrate skin. If fluid gets in eyes or skin, flush with large quantities of water and seek medical attention.
- Wear eye protection when servicing hydraulic components or systems.
- Keep all hoses and connections in good serviceable condition. Check before start-up and periodically during operation.
- Do not investigate for leaks with hands. Use a large piece of cardboard.
- To minimize risk of fire or explosion, follow these battery servicing safety precautions:
 - Sulfuric battery acid is poisonous. Avoid breathing battery fumes.
 - Battery acid is strong enough to burn skin and cause blindness if splashed into the eyes. Protect eyes and skin from contact. In the event of contact with battery acid, immediately rinse in large amounts of water. Obtain medical care if the eyes are burned.
 - Battery gas can explode. Keep sparks and flame away from battery.
 - Never check battery charge by placing a metal object across the battery posts. A spark will occur and cause possible explosion. Use a voltmeter or hydrometer.
- To avoid falls and injury, stand only on areas constructed with “gripstrut” or another skid resistant surface. Keep these surfaces in serviceable condition.
- Never make any alterations or modifications to this equipment including disabling safety devices or interlocks.

⚠ CAUTION

- Before starting repairs which do not require battery power, always turn off the key switch, then disconnect the battery connector from the battery to prevent accidental short circuit.
- Be certain area is clear of people and other equipment before starting operation.
- Keep machine clear of foreign objects and clean of grease/oil and other lubricants.

Failure to heed could result in serious personal injury or death.

In addition to these general safety precautions you will find specific safety messages embedded in the Operating and Maintenance Chapters of this manual. Please review them for your protection.

1.4 EQUIPMENT DESCRIPTIONS

1.4.1 Intended Usage

The unit's purpose is to dispense potable water to aircraft. It is conceivable to use the unit for transporting and dispensing water for other purposes associated with drinkable water or food preparation for human consumption. Do not use it to dispense water for any purpose other than human consumption. Do not use it to transport or store any fluid or substance other than potable water. Any other substance could contaminate the tank and make the unit unsuitable for its intended purpose and create a health hazard to humans.

1.4.2 Description Of The Water Service Truck

This section describes the NMC-Wollard, Inc. Water Service Truck, Model TWS-402, manufactured by NMC-Wollard, Inc., Eau Claire, WI 54703, U.S.A. The unit consists of a standard truck chassis/cab on which is installed a stainless steel potable water tank. Tank capacity is 447 U.S. gallons (1,693 liters). Water-dispensing equipment is contained in a rear compartment. The lift (when installed) and water-dispensing system are hydraulically actuated and powered by an internal hydraulic system. Only one driver/operator is required to operate the unit and dispense potable water to the aircraft. The unit meets all D.O.T. requirements for over-the-road driving.

The unit can be equipped with a personnel lift to provide an elevated platform height of 137 inches (348 cm) above ground.

1.4.3 Chassis (Cab and Engine)

Several modifications/additions have been made to the chassis/cab:

The chassis frame has been shortened eight inches at rear and 1/4-inch steel plates have been welded across end of each channel.

The original parking brake pedal can be replaced by an optional Orscheln lever parking brake system.

1.4.4 Engine

Several modifications have been made to adapt a hydraulic pump, and a throttle advance mechanism has been installed on the carburetor. These are described below.

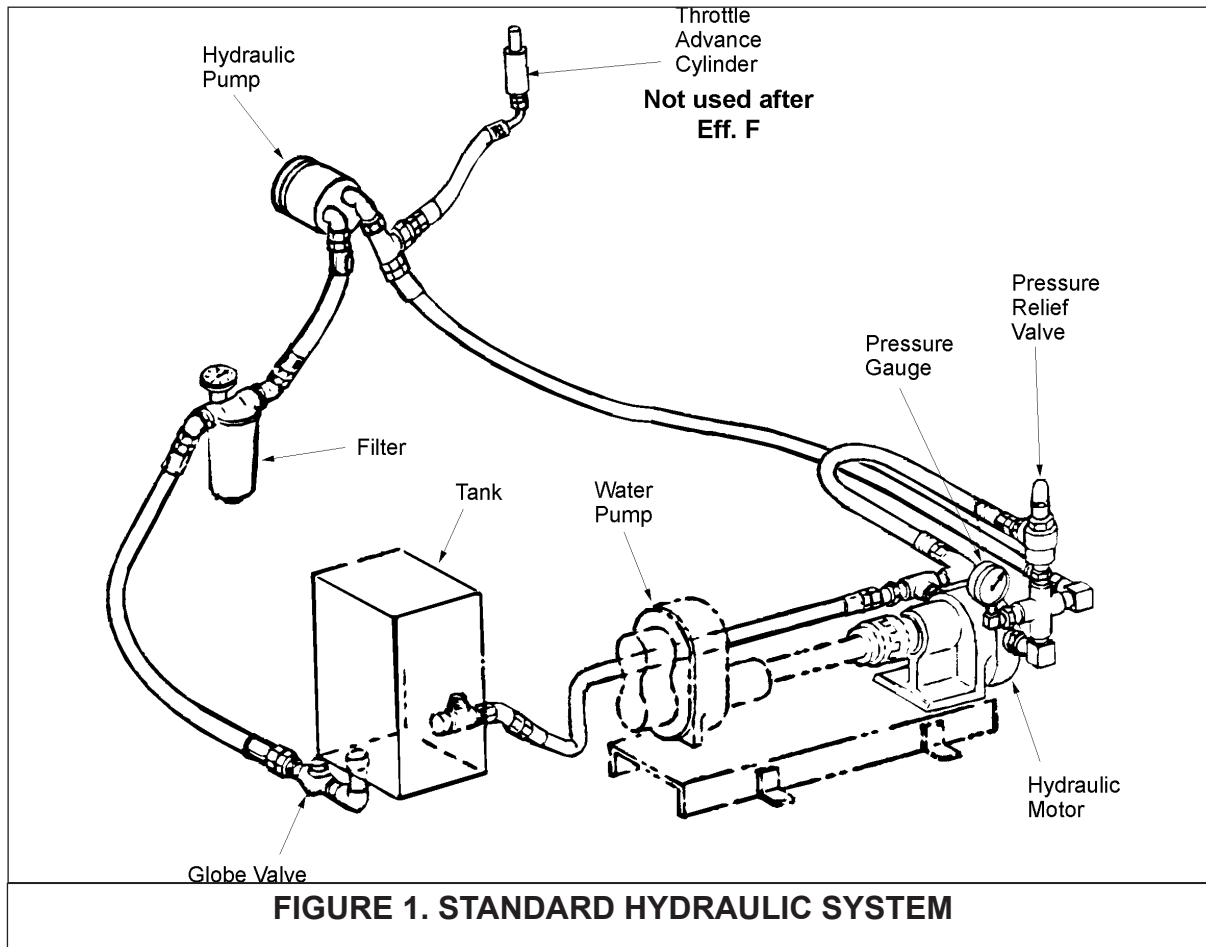
The hydraulic oil pump supplies hydraulic power to run the potable water dispensing pump motor and an actuating cylinder in the optional personnel lift. A longer serpentine belt has been substituted to accommodate the hydraulic pump clutch pulley.

A throttle advance cylinder has been installed on the carburetor. This device advances engine speed from idle to 1,000 rpm to drive the hydraulic oil pump at a speed sufficient to drive the water pump and power the lift cylinder in the (optional) personnel lift.

The cab hot water heater plumbing has been modified and two "Y" fittings installed to extend hoses to a heater in the water pumping compartment at rear of unit. (Heat installation is optional equipment). A diesel engine is offered as an option.

1.4.5 Hydraulic System

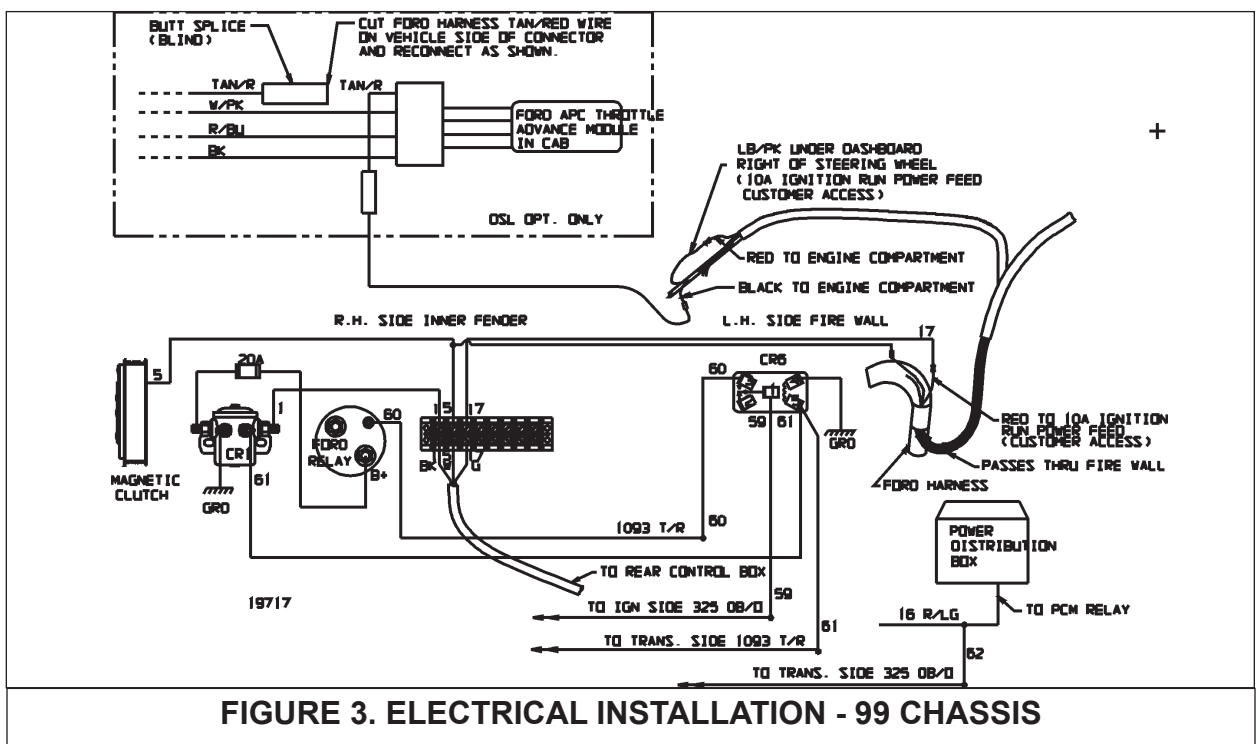
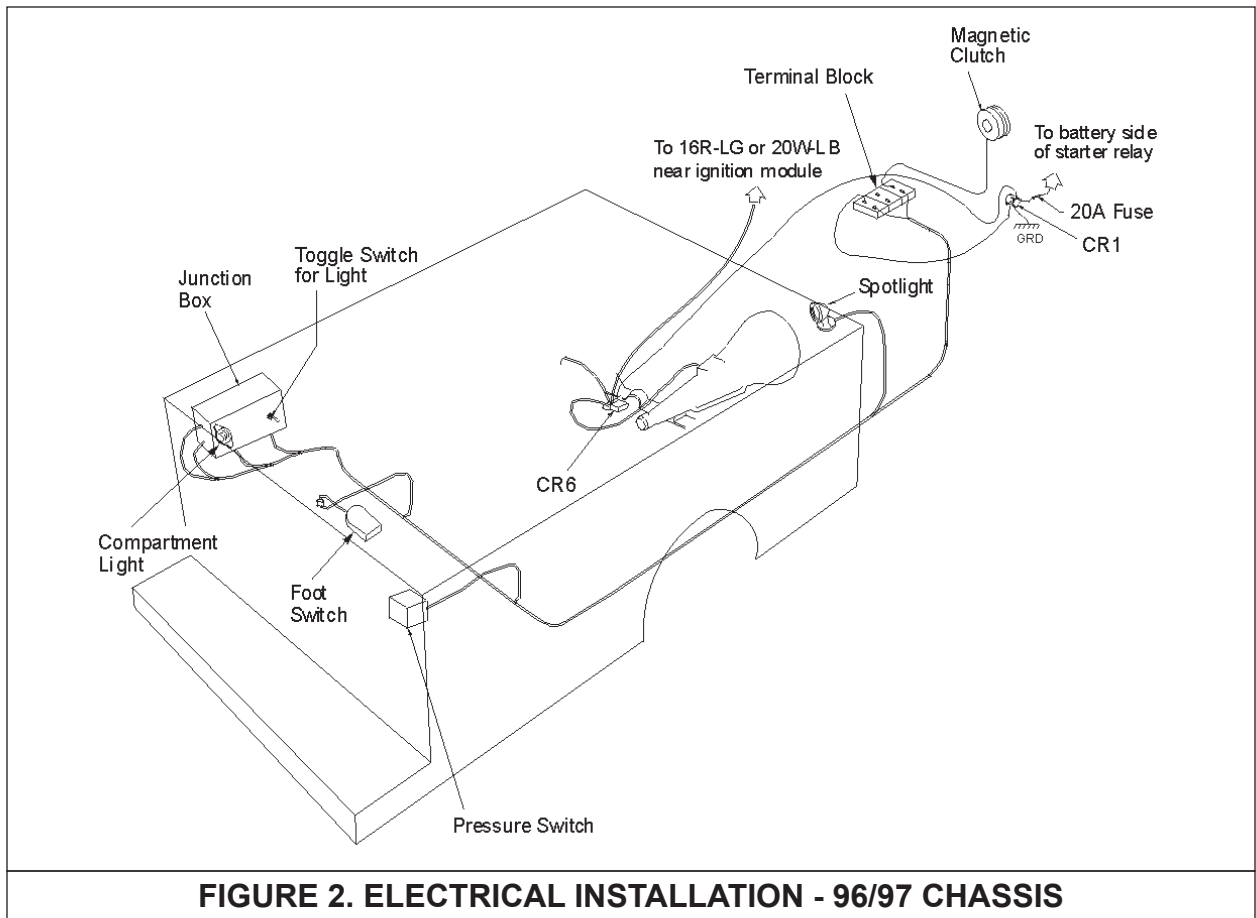
The hydraulic pump provides hydraulic power to the hydraulic motor, which drives the potable water dispensing pump, and also to a hydraulic cylinder in the optional personnel lift. The pump is coupled to a magnetic clutch which is driven by the serpentine belt. It gets hydraulic oil from a 15 U.S. gallon (57L) tank through a 100-micron filter or strainer. Hydraulic pressure hoses connect the pump to the hydraulic motor installed in a compartment at rear of unit. The optional personnel lift system uses the same hydraulic drive as the standard unit. When the lift is installed, an additional hydraulic circuit is incorporated into the standard, with the addition of a direction control valve and hoses.



The hydraulic oil pump supplies hydraulic power to the potable water dispensing pump drive motor. Attached to the pump is a magnetic clutch through which the pump is driven by the serpentine belt. The clutch is energized by a foot switch mounted on the rear deck or optional push button station.

A hydraulic oil filter is located in the suction hose line between the hydraulic oil tank and pump. The filter has a suction gauge to indicate condition of the filter element.

A bronze hand-operated gate valve is located at the bottom of the hydraulic oil tank to shut off oil flow when required, such as during maintenance work. A pressure-relief valve protects against excessive pressure buildup. When pressure exceeds 1,200 psig, this valve opens to return oil to the tank. If the personnel lift



option is used, this relief valve is not required because the direction control valve includes an integral relief.

A pressure gauge allows the operator to monitor system pressure. The hydraulic oil tank working capacity is 15 U.S. gallons (57 liters). There is a plug in the bottom of the tank for draining. A sight gauge is provided for check oil level.

Hydraulic System (with Personnel Lift)

The hydraulic control valve directs hydraulic power to the lift cylinder. The valve is a tandem, single-stack, four-way solenoid-operated type. The solenoids are powered by the truck's 12VDC alternator/battery system. A pressure relief valve is incorporated in the valve unit and is factory set to open at 1,200 psig (105.5 kg/cm²) and normally needs no further adjusting. The valve has a "power beyond" feature, directing oil to the water pump drive motor when the lift is not being raised.

1.4.6 Optional Mico Brake

This option allows you to lock the front brakes while parked.

1.4.7 Electrical Systems

All electrical power required to operate the Water Service Truck is supplied by the truck's alternator/battery system, with one exception: when heating equipment (optional) is installed for cold weather operation. This installation includes a 120 VAC space heater in the potable water pumping compartment and an immersion heater in the potable water tank. Electric power in this case requires an external 110 VAC, 60 Hz source.

We will not attempt to describe the basic truck's electric system because it is conventional for this type chassis/cab. However, if any further information regarding the basic truck electrical system is required, it can be obtained from the owner/operator and shop manuals supplied by the chassis/cab manufacturer (Ford).

Standard Electrical System (No optional equipment installed)

Figure 2 or 3 (also see figure 2-2-2)

This is the basic system to which additional components and wiring are added according to the optional equipment installed. The standard system includes:

terminal block, foot switch, magnetic clutch, pressure switch, spotlight, and domelight.

- Terminal block. Mounted on top of right fender well.
- Foot switch. A foot treadle switch controls water pumping. Switch is detented to maintain either open (OFF) or closed (ON) position. When switch is rocked to (ON) position, it energizes the electric clutch to engage the hydraulic pump. Switch will remain (ON) until rocked back to (OFF), disengaging the clutch and throttle advance.
- An optional push button station is available to control the water pump. There is a low pressure switch with this option to shut off the water pump in the event the water tank should go empty.
- Electric clutch. This drives hydraulic oil pump. Clutch receives electric power when foot-operated switch is depressed (ON) and circuit is closed.
- Throttle advance cylinder. This advances truck engine speed from idle to fast RPM to rotate hydraulic pump sufficiently to produce enough hydraulic pressure (approx. 1,100 psig or 77 kg/cm²) to operate water pump drive motor.
- Pressure switch automatically stops pumping operation when water pressure exceeds 42 psig (3 kg/cm²).
- Spotlight provides outside illumination for nighttime operations. Control switch is integral.
- Domelight provides illumination in pump compartment in rear of unit. Control switch is integral.

Optional Electrical Equipment

There are several additions and modifications to the basic electrical system described above when certain optional equipment is installed on the water service truck. These are described below:

Personnel Lift

The basic system changes little with incorporation of the lift. Two operating stations are built into the lift proper, one high platform mounted, with lift, pump, and spotlight controls, and a second station accessible from the ground, with only pump control. The standard pump foot switch is removed.

Heat Installation

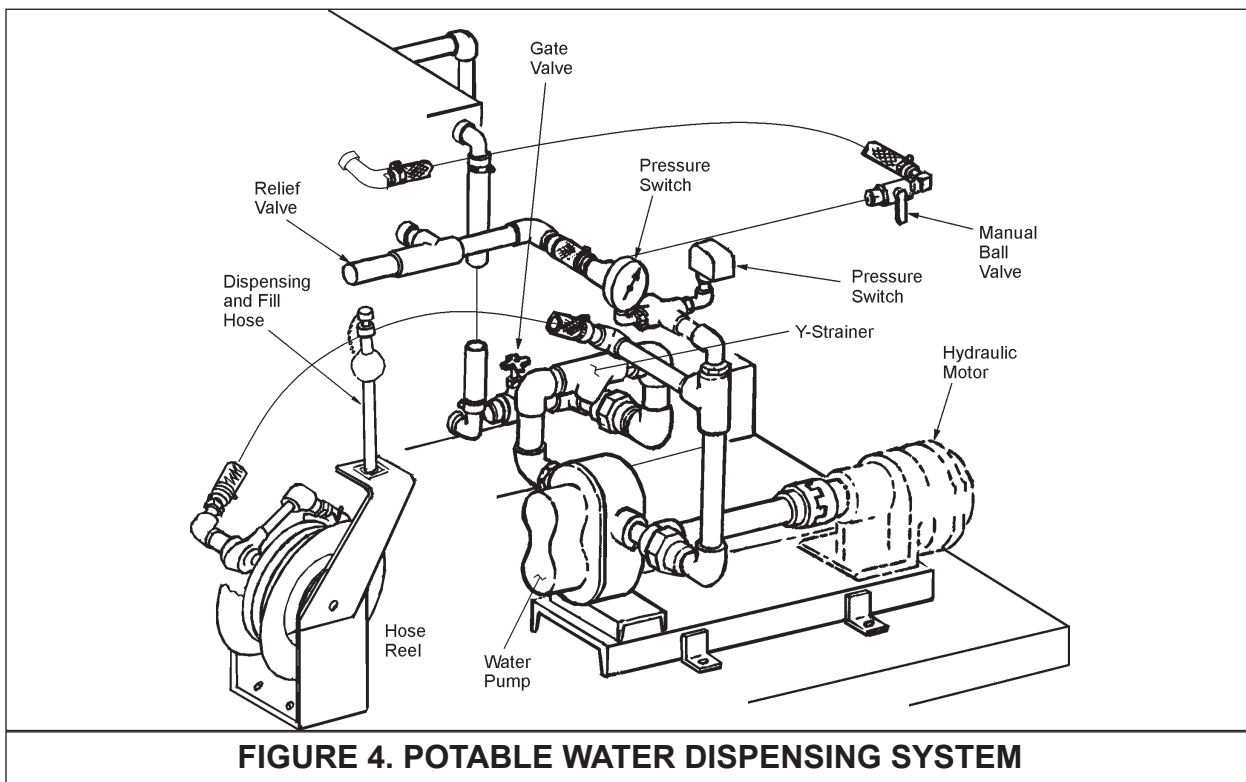
Heating equipment is installed in the water pumping compartment and the potable water tank to prevent the tank water and piping from freezing in cold weather.

The installation includes a hot-water space heater and 120 VAC space heater in the pumping compartment and an immersion heater element in the water tank.

The hot-water space heater receives hot water from the truck engine cooling system through “Y” fittings connected into the cab hot water heater hoses in the truck engine compartment. Insulated hoses extend from the “Y” fittings to the space heater in the pumping compartment. A 12 VDC fan, controlled by a switch in the truck cab, circulates the warmed air.

The 120 VAC space heater in the pumping compartment and the immersion heating element in potable water tank receive electric power from an external 110/120 VAC power source. A receptacle, on left side of unit at rear, connects to an external 110/120 VAC supply cable. A red indicator light on the receptacle illuminates when system is connected to the external source and the power is on.

1.4.8. Potable Water Dispensing System



The potable water pumping system disperses potable water to the aircraft from a 447 U.S. gallon (1,693 liter) welded stainless-steel tank. A hydraulic oil

pump driven by the truck engine, supplies hydraulic power through high-pressure hydraulic hoses to a hydraulic motor in the rear compartment. The motor is connected to the potable-water dispensing pump with a flexible coupling. The pump draws potable water from the tank through a "Y" type strainer and dispenses to the aircraft through a 22-foot (671 cm) clear plastic hose. The hose is wound on a reel located in the compartment. The reel is spring-loaded and will automatically rewind the hose for storage. A normally closed drain back line connects the pressure side of the water system to the tank with a hand-operated ball valve, which has been specially modified to permit drain back of the water to tank after pumping stops. It also provides a refill path to the tank when connecting the dispensing hose to a water supply. The system will deliver water at a rate of 30 U.S. gallons per minute at the discharge end of hose. A pressure switch automatically shuts off the pumping operation when pressure exceeds 42 psig (3 kg/cm²). A backup safety mechanical relief valve bypasses the flow of water if electrical power to the pressure switch fails. This valve cracks at approx. 25 psig (1.75 kg/cm²). The following are descriptions of components installed in the water dispensing system.

- Water pump. Dispenses potable water to the aircraft.
- Gate valve. One-and-one-half-inch bronze gate valve closes water outlet to the pump when desired.
- Y-strainer. Contains a 100-mesh strainer to remove particles from water before entering the system. Unit is cleaned by removing the plug from one side of "Y" and removing strainer.
- Manual ball valve. Normally closed, valve has a passage to permit back draining. Open this valve only to refill the tank.
- Relief valve. Protects system from excessive pressure build-up in case of failure of pressure switch and/or 12 VDC electrical system failure.
- Pressure gauge. Monitors pressure of water being delivered to the aircraft.
- Pressure switch. Stops pumping operation when pressure in system reaches 42 psig (3 kg/cm²) or below 4 psi with push button pump start-stop option.
- Hose reel stores the 22-foot dispensing hose. Reel is spring-loaded and will rewind hose automatically.
- Dispensing hose. A clear plastic hose with a coupling attached to the dispensing end for connecting to water fill fitting on aircraft. A cap to close-off hose end when not in use is attached to end of hose, along with a chain to prevent its loss.
- Potable water tank assembly. This is a 447 U.S. gallon (1,693 liter) welded stainless-steel tank. Tank is insulated with two-inch-thick styrofoam material.
- A sump tank is built in at the rear center of tank to provide a safety reservoir

- for the optional immersion heater. This feature keeps the immersion heater immersed even when main tank level falls below the level of installed heater. A main tank drain, located at bottom rear of tank, allows drainage prior to flushing or cleaning the tank. A second drain plug (immersion heater sump drain) is located next to the main drain on the centerline of the tank. The sump drain is used in conjunction with the main drain prior to flushing and cleaning operations.
- Cold Weather Protection (Optional). The unit may be protected from freezing by three heaters. Two heaters operate on 110-volt AC power supplied by a three-conductor cable from an external source. The cable receptacle is located on the left side of unit at rear. A pilot light near the receptacle indicates when power is being supplied to the heaters. One heater is an immersion-type located in the water tank. The other is a space heater (with fan) located in the pumping compartment. The third heater, a space type, is also installed within the compartment. This unit is warmed by hot water from the truck engine cooling system. A 12-volt DC fan circulates the warmed air about the compartment. In addition to the heaters, the pumping compartment doors and the drain extension are insulated.

1.4.9 Personnel Lift

A personnel lift is available as optional equipment. The lift allows service personnel to work aircraft having potable water fill connections beyond reach of the standard unit deck. The lift is a scissor type and is mounted on the rear deck or rear bumper. It will give the operator a working height of 71-137 (180-348 cm) rear top mounted and 27-93 (68-236 cm) rear bumper mounted above ground. The lift is raised by a hydraulic cylinder powered by the hydraulic system.

2. OPERATION

⚠ WARNING Read and understand the Owner's Manual before operating this machine. Failure to follow the safety instructions could result in serious injury or death.

⚠ WARNING DO NOT use ether as a starting aid. The engine is equipped with glow plugs or with an automatic preheater. Highly flammable ether and similar starting aids exposed to these devices can cause a fire or an explosion.

⚠ WARNING Limit travel speed. Ground conditions, congestion, slope, location of personnel and other factors increase risk of collision or injury to personnel.

⚠ WARNING To prevent serious injury, all riders must ride in a passenger seat with seat belt provided for this purpose and with the safety belt fastened.

⚠ CAUTION Always approach turns slowly and carefully. When approaching blind corners or steering around obstructions, reduce speed and proceed cautiously.

⚠ CAUTION Be extremely alert during hazardous operating conditions. Operating conditions can change as work progresses and as weather changes.

Operation of the NMC-Wollard, Inc. Water Service Truck is fairly simple. All controls are clearly marked and self explanatory. All persons involved with the operation of the unit should first become familiar with the controls shown in Figures 5 through 8. No special instructions are given for the operation of the truck because it is a conventional automotive vehicle and therefore should present no problems to the operator. Refer to the truck manufacturer's (Ford Motor Co.) operator manual.

2.1 DAILY INSPECTION

Before putting the unit into service and each day before operating the unit, always walk around the unit and make the following checks:

1. Look for fluid leaks on the ground and on hydraulic components. Check hydraulic hose and fitting connections for leaks and hose condition
2. Check level of hydraulic oil by observing the sight gauge on hydraulic reservoir.
3. Check the level of potable water in the water tank. Never operate the potable water dispensing pump without water in tank or the pump may be damaged.
4. Check all critical fastener connections for security.
5. Remove any foreign objects, grease, oil or other lubricants from platforms.
6. If so equipped, check the fire extinguisher for adequate charge.
7. Check truck chassis and engine in accordance with manufacturers instructions
8. Observe that tires are properly inflated.

⚠ WARNING Regularly check tires and wheels for proper tire inflation or loose wheel studs/nuts. Dual wheel sets must have equal inflation in both tires to prevent tire overloading. Wheel or tire failure could result in loss of vehicle control.

9. With the ignition switch on:
 - Check the fuel gauge for sufficient fuel for the day's operation. Check the instrument panel for low volts or low oil pressure and any other fault indications.
 - Check that horn, windshield wipers, headlights, tail lights, stop lights, backup lights and beacons are operational.
 10. Start engine and allow to warm up at idle speed for a few minutes.
 11. Check operation of brakes and power steering.
- If all of the above checks are satisfactory, the unit is ready to service aircraft.
If trouble is discovered during any of the above checks, report the problem to the proper maintenance personnel for correction before further operation.

2.2 FILLING THE POTABLE WATER TANK

Turn the manual ball valve in the pumping compartment to "on" position (handle in the line with the hose).

Attach the fill/dispense hose to the designated potable water source.

Turn on the source valve. A sight gauge in rear compartment indicates water level.

Be sure to replace cap on end of hose and carefully allow hose to rewind onto hose reel.

2.3 DISPENSING POTABLE WATER TO AIRCRAFT

⚠ WARNING Always apply park brake when shifted to neutral (N). Unintended movement could result in persons falling or being crushed.

⚠ WARNING Be sure that the shift control lever is secure in the neutral detent and the parking brake is applied to prevent unintended movement that could result in serious injury or death.

1. Position unit near to aircraft close enough so operator can reach aircraft fill fitting by standing on the ground or on tank deck. Set parking brake, place shift lever in neutral, leave engine running, and leave cab.
2. Pull out hose from compartment and remove end cap.
3. Start water pump by depressing foot switch to START position. Allow some water to be pumped out onto ground to clear hose of any foreign matter.
4. Stop pump. Depress foot switch to STOP position.
5. Connect hose to fill fitting on aircraft.
6. Start pump by depressing foot switch to START position. When aircraft tanks are filled, the pressure switch will automatically stop the pumping operation. Pumping can also be stopped at any time by depressing the foot switch to STOP position.

NOTE: When the pumping operation is completed and pump has stopped, any water remaining in hose will drain back into tank.

7. Remove hose from aircraft fill fitting after pump has stopped and replace cap.
8. Carefully allow hose to rewind on storage reel.

2.4 DISPENSING POTABLE WATER (WITH OPTIONAL TOP MOUNTED LIFT)

The procedure for dispensing potable water is similar to that given above, except that the pumping and lift functions are performed with toggle switches.

1. Position unit close enough to aircraft so operator can reach aircraft fill fitting by standing on the ground or on tank deck. Set parking brake, place shift lever in neutral, leave engine running, and leave cab.
2. Pull out hose from compartment and remove cap from end.
3. Start water pump by positioning PUMP toggle switch (located on rear of lift base) to ON position. Allow some water to be pumped out onto the ground to clear hose of any foreign matter.
4. Stop water pump. (Place toggle switch in OFF position.)
5. Climb onto tank deck and raise safety handrails on lift platform. Be sure to secure rails in raised position with latches.
6. Attach hose to bracket on handrail.
7. Raise lift by positioning LIFT toggle switch in UP position and hold until lift has raised to desired height. Release switch.
8. Connect hose to fill fitting on aircraft.
9. Start potable water pump by holding PUMP toggle switch in ON position. Aircraft tanks will begin to fill. When tanks are full, the pressure switch in system will stop pumping operation. Pumping can also be stopped at any time by releasing PUMP toggle switch.

NOTE: When the pumping operation is completed and pump has stopped, any water remaining in hose will drain back into tank.

10. Remove hose from aircraft fill fitting after pump has stopped and replace hose cap.
11. Replace hose in bracket on handrail.
12. Lower lift by positioning LIFT toggle switch in DOWN position and hold until lift is fully lowered. Release switch.
13. Remove hose from bracket on handrail and carefully allow to rewind onto hose storage reel.
14. Release handrail latch and fold handrail down against lift platform.

2.5 DISPENSING POTABLE WATER (WITH OPTIONAL BUMPER MOUNTED LIFT)

The procedure for dispensing potable water is similar to that given above, except that the pumping and lift functions are performed with push button switches.

1. Position unit close enough to aircraft so operator can reach aircraft fill fitting by standing on the ground or on tank deck. Set parking brake, place shift lever in neutral, leave engine running, and leave cab.
2. Pull out hose from compartment and remove cap from end.
3. Start water pump by pushing PUMP start button (located in push button station). Allow some water to be pumped out onto the ground to clear hose of any foreign matter.
4. Stop water pump. (Push stop button.)
5. Climb onto bumper deck and raise safety handrails on lift platform. Be sure to secure rails in raised position with latches.
6. Attach hose to bracket on handrail.
7. Raise lift by pushing the LIFT button switch and hold until lift has raised to desired height. Release switch.
8. Connect hose to fill fitting on aircraft.
9. Start potable water pump by holding PUMP push button switch in. Aircraft tanks will begin to fill. When tanks are full, the pressure switch in system will stop pumping operation. Pumping can also be stopped at any time by releasing PUMP push button switch.

NOTE: When the pumping operation is completed and pump has stopped, any water remaining in hose will drain back into tank.

10. Remove hose from aircraft fill fitting after pump has stopped and replace hose cap.
11. Replace hose in bracket on handrail.
12. Lower lift by pushing the LIFT DOWN push button in and hold until lift is fully lowered. Release button.
13. Remove hose from bracket on handrail and carefully allow to rewind onto hose storage reel.

2.6 HEATER OPERATION

There are two heating systems in the unit to prevent freeze-up during cold weather:

- A hot water space heater in the pumping compartment
- An optional 110-volt AC system with a pumping compartment space heater and an immersion heating element in the rear bottom of the water tank.

The hot water space heater receives hot water from the truck engine cooling system through insulated hoses connected to "Y" fittings in the engine compartment. The

heater has a 12-volt DC fan to circulate the warmed air. The fan is controlled by a switch on the control box in the rear compartment.

The optional 110 VAC heating system receives 110 VAC from an external source. A receptacle on left rear side of the unit will accommodate a three-conductor supply cable. The receptacle is identified by a placard which reads, "110 VAC ONLY, PILOT LIGHT MUST BE ON FOR HEATERS TO OPERATE." The pilot light indicates when the heaters are on. To energize the heaters, connect a three-conductor cable to a 110 VAC external source and to the receptacle on the unit.

IMPORTANT! The space heater and immersion heater element are rated at 3,500 watts. Be sure the power source is properly fused and the supply cable is of sufficient wire size before connecting to unit.

2.7 OPERATION OF OPTIONAL MICO LEVER BRAKE

This system provides the ability to hydraulically lock the front brakes to supplement the holding power of the rear mechanical parking brake. To operate, step on the brake pedal and lift the lever up (figure 2), the green indicator light should turn on. If it does not come on, you need to step on the brake harder. Only if the indicator lights are on, are the brakes adequately set. Flip the lever down to release front brakes.

2.8 OPTIONAL REAR BUMPER LIFT

When standing in the platform to operate the lift, be sure to close and lock the gate. The gate lock handle is turned UP while pushing it through the slotted latch plate. Letting the handle turn down by gravity will lock it. Push on the gate before operation to be sure it is locked

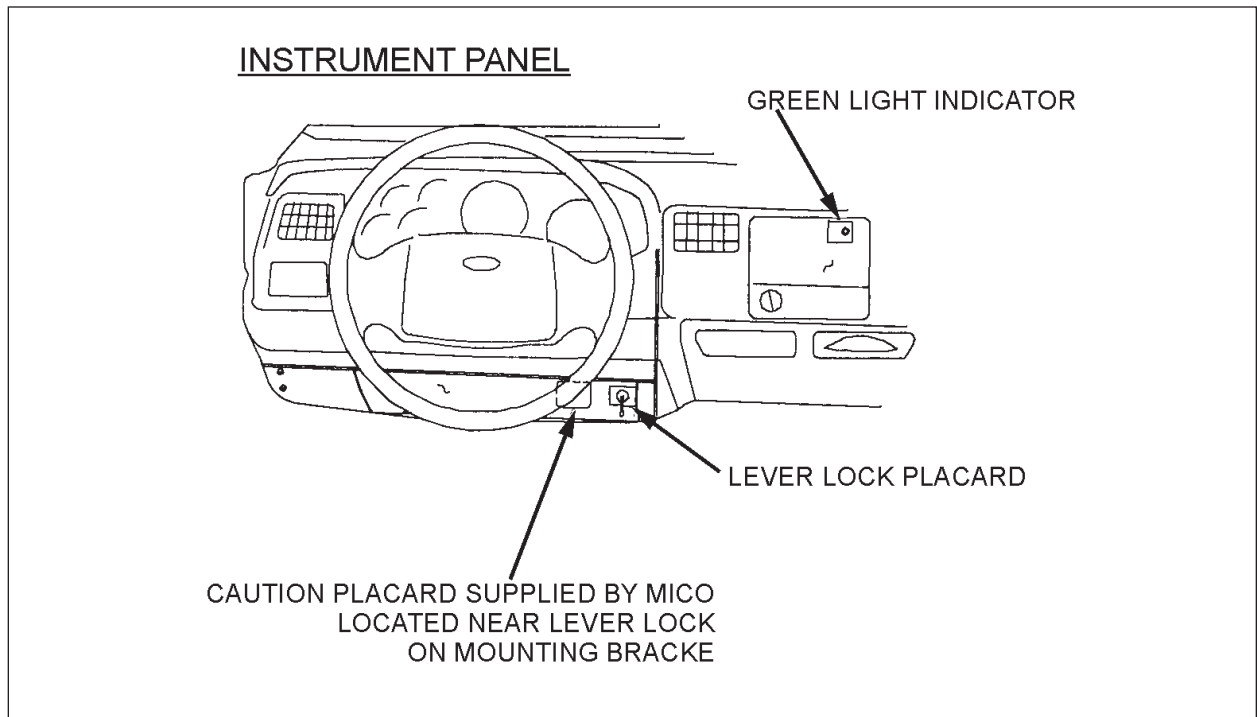
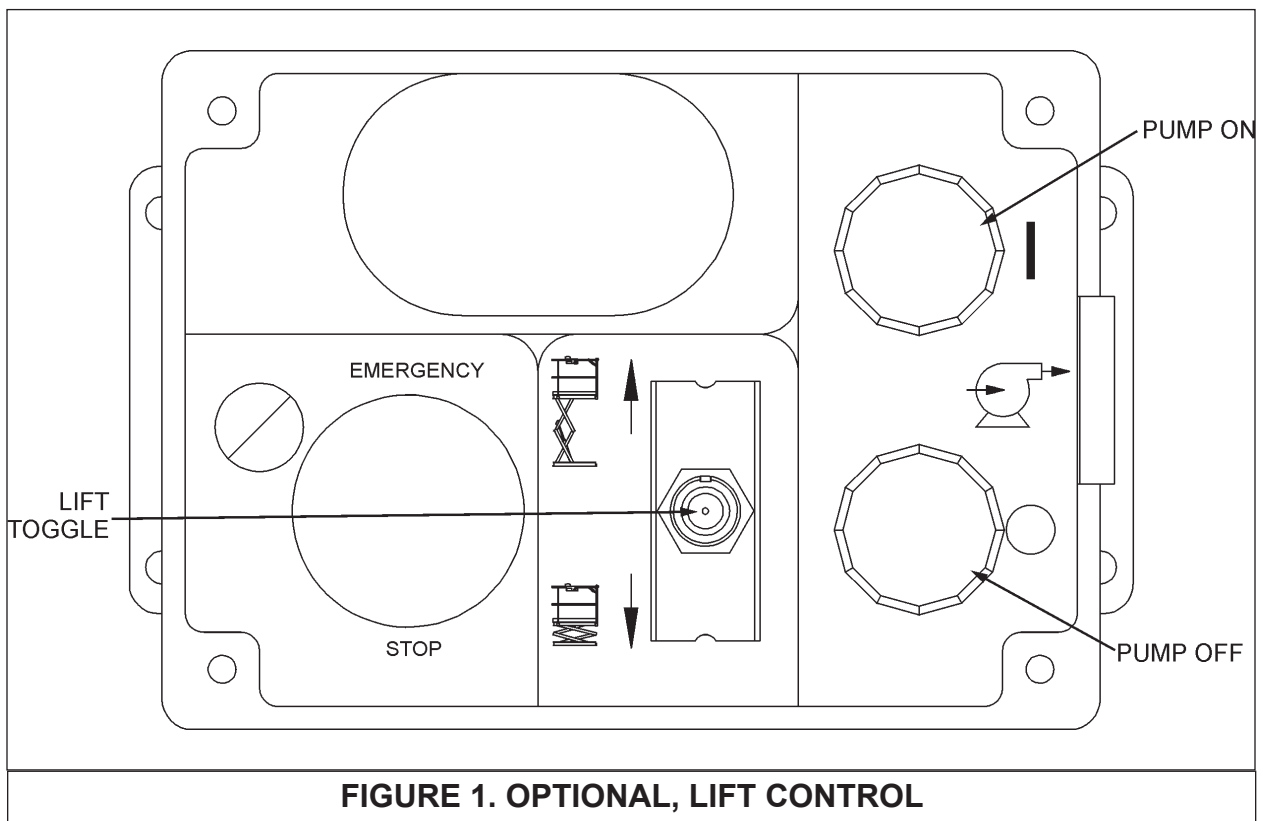


FIGURE 2. OPTIONAL MICO LEVER BRAKE

2.8.1 Lift Control



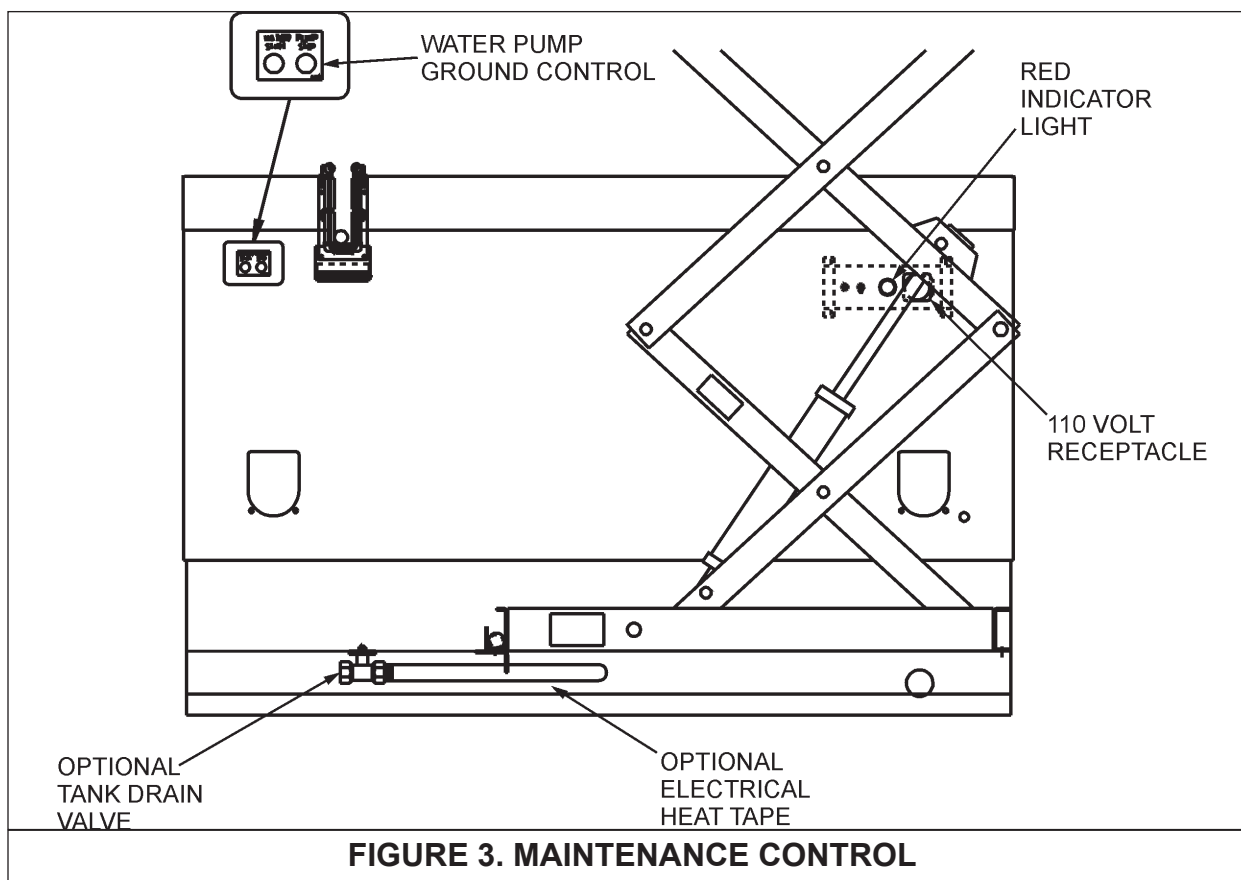
Emergency Stop - To stop all lift operation immediately, push on the red emergency (mushroom) stop button. To resume operation, pull the emergency stop button out to reset.

To operate the lift, push the LIFT toggle switch forward for raise and rearward for lowering. The switch is spring return to OFF.

To operate the fresh water pump, push on the green "PUMP ON" button. To shut off the pump, push on the red "PUMP OFF" button.

2.8.2 Maintenance Control Rear Bumper Mounted Lift

Figure 3.



For lift maintenance, use the lift UP/DOWN switch that is located inside the right rear compartment on the front of the ground control box. Push the LIFT toggle up to raise or down to lower. The switch is spring return to OFF.

2.8.3 Ground Control

The compartment radiator heater fan is turned ON by pushing the fan switch UP. A 110 volt receptacle is provided on the right rear of the vehicle. Power can be supplied to this receptacle to power the immersion tank heaters, electric space heater in the compartment, and electric heat tape on drain pipe. Whenever power is supplied to this control, the red indicator light will be on.

The fresh water pump can be operated from the ground. There is a water pump control panel on the left rear of the vehicle when the unit does not have a lift. Push the "Start" button to operate the pump. Push the "Stop" button to disengage the pump.

There is an optional tank drain valve located under the rear bumper decking. Turn the valve counterclockwise to open and drain the tank. Turn the valve clockwise to shut off the tank drain.

2.8.4 Emergency Lower Control

Figure 4.

If there is a power failure, the lift can be lowered slowly by pulling on the Emergency Down handle located at the lift base on the passenger side of the truck.

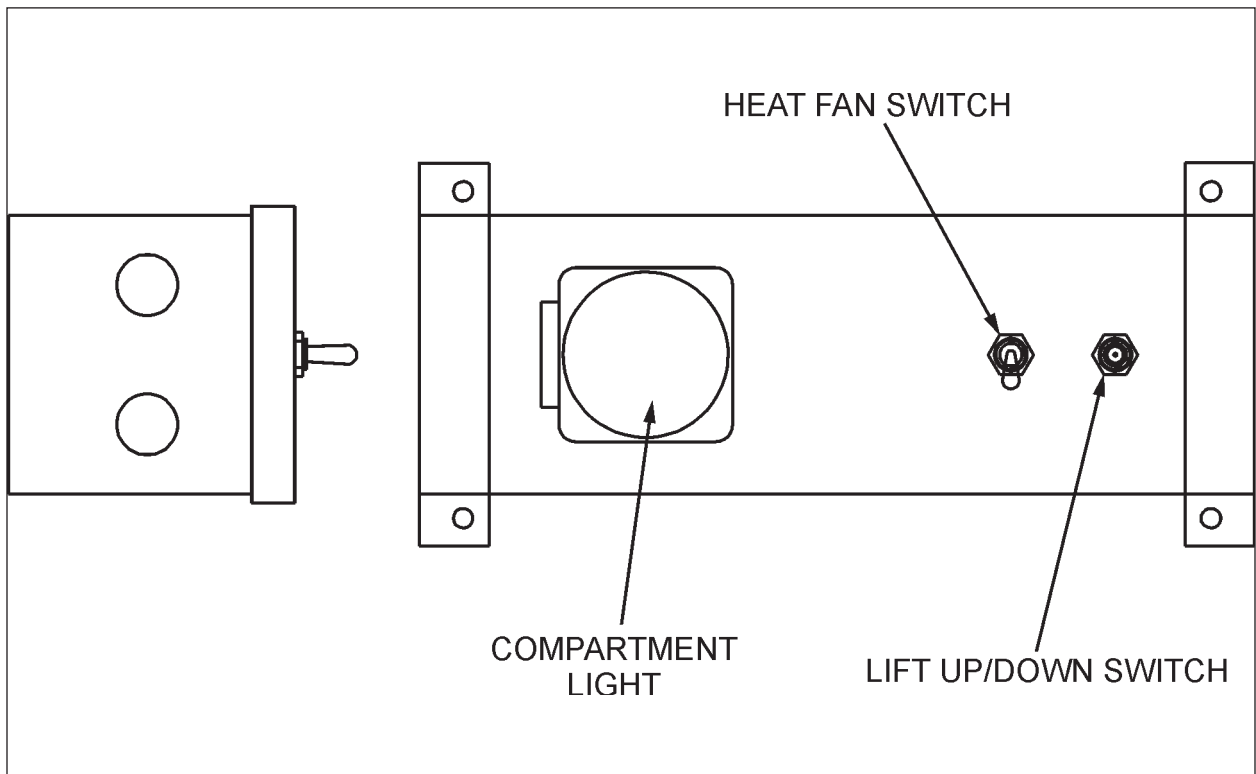


FIGURE 4. GROUND CONTROL

2.8.5 Interlock Shutdown

(Std on Rear Bumper Mounted Lift, Optional on Top Mounted Lift)

If the lift is raised any amount, a red indicator light comes on in the truck cab. Do not attempt to move the truck if this light is on.

There is a proximity switch to sense when the lift is lowered. If the lift is not completely lowered and the truck is put into gear, it will stop the engine.

3. SPECIFICATIONS AND CAPABILITIES

3.1 96/97

3.1.1 Dimensions

Overall length 225" (572 cm)
Overall width 78" (198 cm)
Overall height (Road configuration) 71" (180 cm)

3.1.2 Personnel lift - Fully up

Platform floor 137.25" (349 cm)
Top of handrails 79.25" (445 cm)
Top of tank 59" (150 cm)

3.1.3 Weights

Unit without lift, water tank empty 7,210 lbs. (3,297 kg)
Unit with lift, water tank empty 7,780 lbs. (3,557 kg)

3.1.4 Capacities

Potable water tank 447 U.S. gallons (1,693 liters)
Hydraulic oil tank 15 U.S. gallons (57 liters)
Fuel tanks (2) (1996/1997) 19 U.S. gallons (76 liters) each

Truck Chassis

Ford Series F-350, Type F37

Gasoline Engine Ford 350 (5.8L) V10, Fuel injected

Diesel Engine (option) Ford 7.3L (engine block heater standard)

Axle (Dual Wheel)

Front 4,000 lbs. (1,814 kg.)

Rear 7,800 lbs. (3,538 kg.)

Axle ratio (99-2001, 6.8L, V10, Gas, California) 4.30

Axle ratio (2001, 5.4L, V8, Gas) 3.73

Brakes

Service Self-adjusting, dual power

Cab Custom conventional

Electrical

Alternator Motorcraft 60-ampere

Battery 650CCA

Shock absorbers Heavy duty, front and rear
Steering Power steering
Transmission Ford Heavy Duty automatic 4-speed (1997)
..... Ford C-6 Automatic 3-speed (1996)
Diesel Option Ford heavy duty 5 speed w/overdrive,
..... close ratio, limited slip
..... (Automatic transmission also available with diesel)

Standard Options and Accessories

Heavy Payload Package (11,000 GVWR) (6,420 lbs. max. payload)
Heavy Duty Front Suspension
Super Engine Cooling
Dual Rear Wheels
Single Fuel Tank
Heater and windshield defrosters
Windshield wipers - Dual electric
Windshield washers
Turn signals
Outside rear view mirrors - swing-away, low-mount
Sun visors
Metal fuel sediment bowl
Reflectors in accordance with ICC regulations

3.2 99/00**3.2.1 Dimensions**

Overall length	241(612 cm)
Overall width.....	90.7 (230 cm)
Overall height (Road configuration).....	76.5 (194 cm)

3.2.2 Personnel lift - Fully up

Platform floor	136(345 cm)
Top of handrails	178(452 cm)
Top of tank.....	60(152 cm)

3.2.3 Weights

Unit without lift, water tank empty.....	7870 (3570 kg)
Unit with lift, water tank empty.....	8400 (3810 kg)

3.2.4 Capacities

Potable water tank.....	447U.S. gallons (1,693 liters)
Hydraulic oil tank.....	15U.S. gallons (57 liters)
Fuel tanks (1)	Midship 19 gallon
Hydraulic tank with rear bumper lift.....	7.5gallons

Truck Chassis

Ford Series F-350, Type F37

Gasoline Engine Ford 350 (6.8L) V10, Fuel injected

Diesel Engine (option) ... Triton Ford 7.3L (V10 eng. block htr. standard)

Brakes

Service Self-adjusting, dual power

Cab.....F350 Super Duty

Electrical

Alternator..... Motorcraft 95 ampere

Battery 650CCA

Shock absorbers Heavy duty, front and rear

SteeringPower steering

Transmission 4R100 Heavy Duty Electronic Automatic 4-speed

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CHAPTER 2 MAINTENANCE

1. SERVICING	1
1.1 PREVENTIVE MAINTENANCE	1
1.3 BOLT TIGHTENING DATA	2
1.2 AS REQUIRED	3
1.2.1 Truck Engine and Chassis	3
1.2.2 Draining The Water Tank	3
1.2.3 Cleaning the Water Tank Interior	3
1.3 WEEKLY	4
1.3.1 Check Hydraulic Reservoir	4
1.4 EVERY 100 HOURS	4
1.4.1 Clean Y-Strainer	4
1.4.2 Clean Side Panels, Treads, and Deck	4
1.4.3 Inspect Water Truck	4
1.5 EVERY 250 HOURS	5
1.5.1 Change Hydraulic Oil	5
1.5.2 Lubricate Lift Assembly	5
1.6 YEARLY	6
1.6.1 Change Hydraulic Oil	6
1.7 ADJUSTMENTS	7
1.7.1 Hydraulic Pump Drive Belt	7
1.7.2 Throttle Advance For Gas Engines With Advance Cylinder (EFF SN.....	7
0363-)	7
1.7.3 Throttle Advance For Gas Engines With Potentiometer (EFF SN 0364+)....	7
1.7.4 Hydraulic Pressure Setting	8
1.7.5 Maintenance Safety for Optional Rear Bumper Lift	9
1.7.6 Potable Water Dispensing System	10
2 TROUBLE SHOOTING	1
2.1 PROBABLE CAUSE AND REMEDIES-HYDRAULIC	1
2.2 SCHEMATICS	3
3 REMOVAL AND INSTALLATION	1
3.1 GENERAL	1
3.2 STRUCTURAL COMPONENTS	2
3.3 ELECTRICAL COMPONENTS REMOVAL AND INSTALLATION	2
3.4 HYDRAULIC COMPONENTS REMOVAL AND INSTALLATION	2
3.5 PERSONNEL LIFT	3
3.5.1 Removal and Installation	3
3.5.2 Hydraulic Cylinder	5
3.6 HYDRAULIC SYSTEM – SPECIAL INSTRUCTIONS	5
3.7 HYDRAULIC SYSTEM SAFETY	6
3.8 FORD 6.0L DIESEL CLUTCH PUMP KIT INSTALLATION	7
3.9 F350 V8/GAS CLUTCH PUMP INSTALLATION	11
3.10 DEWEZE, FORD 5.4L, 2007+ CLUTCH PUMP INSTALLATION	13
3.11 ADDITIONAL DEWEZE CLUTCH PUMP KITS	13

4 REPAIRS	1
4.1 HYDRAULIC PUMP DRIVE BELT	1
4.2 FORD AUXILIARY POWERTRAIN CONTROL (APC) MODULE	1
4.2.1 96/97 7.3L Diesel	1
4.2.2 1999-Future 7.3L Diesel	4
4.3 PUMP IN PARK ONLY OPTION	10

1. SERVICING

⚠ WARNING Perform lockout/tagout procedures before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could cause serious injury or death.

⚠ WARNING Follow the recommended maintenance program to prevent unsafe operation or accidents.

⚠ CAUTION Keep maintenance area clean and dry. Oily and wet spots are slippery, greasy rags are a fire hazard, and wet spots are dangerous around electrical equipment.

1.1 PREVENTIVE MAINTENANCE

The following is a guide for conducting periodic inspections on the water truck to ensure long service life. The frequencies shown are for the unit operating in average U.S. climate. If the unit is operated in adverse climatic conditions, such as salt spray and extreme cold or dusty environments, adjust the inspection schedules to a more realistic frequency.

Servicing the NMC-Wollard, Inc. Water Truck requires little more attention than other conventional vehicles of its type. No special tools are required, other than those normally found in any modern garage or airline ground support equipment servicing facility. All work should be performed in accordance with authorized standard shop practices.

1.3 BOLT TIGHTENING DATA

The following data is excerpted from SAE Report J1701, March, 1999. The complete report is available from SAE at www.sae.org. It contains detailed information about variables for torque management to achieve correct fastener joint tightening. This is an advisory guide and responsibility for its application lies with the user. Individual application discretion is recommended.

INCH TIGHTENING TORQUE, IN-LB						
Bolt Size	Grade 2 Dry	Grade 2 Lubed	Grade 5 Dry	Grade 5 Lubed	Grade 8 Dry	Grade 8 Lubed
0.250-28	75	56.0	116.0	87.0	164	123
0.250-20	66.0	49.0	101.0	76.0	143	107
0.3125-24	150.0	112.0	230.0	173.0	327	245
0.3125-18	135.0	101.0	209.0	157.0	295	221
0.375-24	272	204.0	420.0	315.0	593	445
0.375-16	240	180	370	278.0	523	392
0.4375-20	428.0	321.0	662.0	496.0	935	700
0.4375-14	384	288	593.0	445.0	837	628
0.500-20	660.0	495.0	1020.0	764.0	1440	1080
0.500-13	585.0	439.0	904.0	678.0	1277	958
0.5625-18	78	59	121	91	171	128
0.5625-12	70	53	109	82	154	115
0.625-18	110	82	170	127	240	180
0.625-11	97	73	150	113	212	159
0.750-16	192	144	297	223	420	315
0.750-10	172	129	269	201	376	282
1.000-12	--	--	704	528	995	746
1.000-8	--	--	644	483	909	681

METRIC TIGHTENING TORQUE N-m						
Bolt Size	Class 8.8 Dry	Class 8.8 Lubed	Class 9.8 Dry	Class 9.8 Lubed	Class 10.9 Dry	Class 10.9 Lubed
8.0 x 1.25	26.40	19.80	28.50	21.40	36.50	27.30
10.0 x 1.50	52.20	39.20	56.60	42.40	72.20	54.20
12.0 x 1.75	91.00	68.00	99.00	74.00	126.00	94.00
14.0 x 2.00	145.00	109.00	157.00	118.00	200.00	150.00
16.0 x 2.00	226.00	170.00	245.00	184.00	313.00	235.00
20.0 x 2.50	441.00	331.00	478.00	358.00	610.00	458.00
24.0 x 3.00	762.00	572.00	826.00	620.00	1055.00	791.00
30.0 x 3.50	1515.00	1136.00	1641.00	1231.00	2095.00	1572.00
36.0 x 4.00	2647.00	1985.00	2868.00	2151.00	3662.00	2746.00

37° TUBE FITTINGS & PIPE FITTINGS						
Dash #	37° SWIVEL NUT	37° JIC FLATS FROM FINGER TIGHT	O-Ring Lock Nut Ft-Lbs.	Pipe Dia. (Inch)	NPT Ft. Lbs.	NPT Turns from Finger Tight
-04	10	2	8	1/4	25	2 1/2
-06	20	1 1/4	13	3/8	40	2 1/2
-08	40	1	21	1/2	54	2 1/2
-10	60	1	33	--	--	2 1/2
-12	80	1	48	3/4	78	2 1/2
-16	110	1	63	1	112	2 1/2
-20	130	1	--	1 1/4	154	2 1/2
-24	160	1	--	1 1/2	211	2 1/2
-32	250	1	--	2	300	2 1/2

Torque Conversion: Ft-Lbs = 0.7376xN-m

N-m = 1.356xFt-Lbs

NOTE: Do not use these values if different torque value is given for a specific procedure

FREQUENCY	DESCRIPTION OF PROCEDURE	REF
AS REQUIRED	Truck Engine and Chassis	1.2.1
	Cleaning the water tank interior	1.2.3
	Hydraulic pump drive belt	1.7.1
	Throttle advance cylinder	1.7.2
	Hydraulic pressure	1.7.4
	Potable water dispensing system	1.7.6
WEEKLY	Check hydraulic oil	1.3
EVERY 100 HOURS	Clean Y-Strainer	1.4.1
	Clean Side Panels, Treads and Deck	1.4.2
	Inspect Water Truck	1.4.3
EVERY 250 HOURS	Change hydraulic oil	1.5.1
	Lubricate lift assembly	1.5.2
YEARLY	Change hydraulic oil	1.6.1

1.2 AS REQUIRED

1.2.1 Truck Engine and Chassis

IMPORTANT! Inspect truck engine and chassis in accordance with the manufacturer's recommended maintenance schedule.

1.2.2 Draining The Water Tank

There are two pipe plugs on the bottom of the tank. Both plugs must be removed to drain the tank completely. The plug on RH side is the main tank drain and the plug in the center drains the emersion heater compartment.

1.2.3 Cleaning the Water Tank Interior

The following water tank cleaning procedures are offered for use where no health codes exist. Or, if local codes are considered marginal, you may wish to use the suggested procedures as an added safeguard.

1. Remove tank clean-out cover.
2. Use fire hose to spray down all inside surfaces.
3. Scrub down all possible internal surfaces, then rinse and drain.
4. Fill tank with water and add 30/s50 parts per million of chlorine (approximately 1/10 quart per 440 gallons). Allow to set for (1) day.
5. Flush tank with fresh, clean water.

1.3 WEEKLY

1.3.1 Check Hydraulic Reservoir

Check level of hydraulic oil in hydraulic reservoir. Add oil as indicated. (MOBIL DTE-13 is recommended.) If an excessive amount of oil is required, start engine, turn on pump and check for leaks after adding oil to FULL mark on dipstick. Level should be checked with hydraulic cylinder (if applicable) in full retracted position.

1.4 EVERY 100 HOURS

1.4.1 Clean Y-Strainer

1. Place water suction line gate valve in OFF position. Valve is located in the pumping compartment between the tank and water pump. The Y-strainer is located in same line as the gate valve.
2. Remove strainer from bottom of Y-fitting by removing hexagon-shaped reducing bushing.
3. Clean foreign particles from strainer.
4. Replace strainer in Y-fitting.
5. Open gate valve fully.

1.4.2 Clean Side Panels, Treads, and Deck

1. Mix 33% Kenosonic-C (or equal) (Kelite Corporation of Chicago and New Jersey), 33% mineral spirits, and 33% water.
2. Wash with above solution using cloth or sponge.
3. Rinse with water hose.
4. Wipe dry.

1.4.3 Inspect Water Truck

Structure

Check the following for damage, cleanliness, security, and proper operation.
Tank frame and tank.

- Tank cover and deck.
- Sight gauge.
- Access ladder

Hydraulic Components

Check the following for leaks, cleanliness, security, and proper operation.

- Hydraulic oil tank.
- Hoses and fittings.
- Solenoid-actuated valves (used with optional personnel lift).
- Hydraulic lift cylinder (used with optional personnel lift).
- Hydraulic pump.
- Hydraulic relief valve.

Electrical Components

Check the following for cleanliness, security of wiring, and proper operation.

- Control switches and boxes.
- Solenoids on hydraulic valves.
- Throttle advance cylinder.
- Spotlights and domelight.
- 110-VAC immersion heating element (optional equipment).
- 110-VAC space heater (optional equipment).
- 110-VAC receptacle, pilot light, and wiring (optional equipment).
- Hot water space heater.

Potable Water Dispensing System

Check the following for leaks, cleanliness, security, and proper operation.

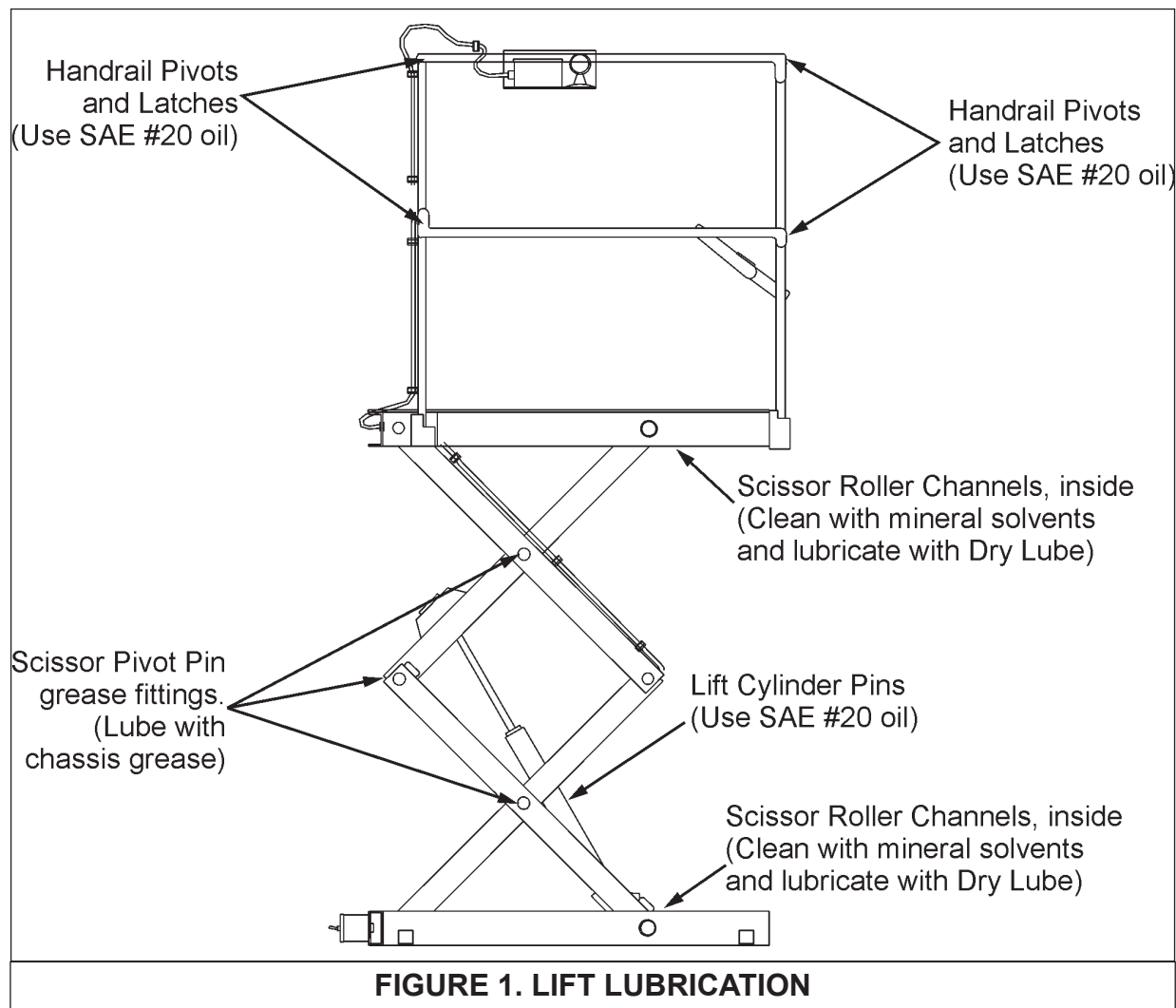
- Water pump.
- Water pump flex coupling.
- Manual fill valve.
- Pressure switch.
- Relief valve.
- Overall plumbing.
- Pump/motor base and shaft guard.
- Hose reel.
- Dispensing hose.

1.5 EVERY 250 HOURS**1.5.1 Change Hydraulic Oil**

Change hydraulic oil filter after first 50 hours of operation, then every 250 hours. Also change if suction gauge indicates element needs changing.

1.5.2 Lubricate Lift Assembly

Lubricate the personnel lift assembly, if installed. See figure 1.



1.6 YEARLY

1.6.1 Change Hydraulic Oil

Drain hydraulic system and refill with new, filtered oil.

NOTICE! Use only MOBIL DTE-13 or equivalent in operating temperatures of +20°F to +120°F (-7°C to +50°C). Use Mobil Aero HFA or equivalent (MIL-H-5606A) in operating temperatures of -25°F to +50°F (-32°C to +10°C). Do not use hydraulic oils of different specifications. They may not be compatible and could result in damage to the hydraulic system components.

1.7 ADJUSTMENTS

1.7.1 Hydraulic Pump Drive Belt

Refer to the Ford operator's manual included with your unit.

NOTICE! Excessive wear and breakage may occur if belt is adjusted too loose or too tight.

1.7.2 Throttle Advance For Gas Engines With Advance Cylinder (EFF SN 0363-)

(See 4.2.2 for Diesel engine)

1. The purpose of the throttle advance cylinder is to increase engine speed when the hydraulic pump is energized. The increase in engine speed drives the hydraulic pump, which supplies hydraulic power to the hydraulic motor.
2. The throttle advance cylinder pushes against the throttle linkage. Cylinder stroke is constant and fully energized anytime the hydraulic pump's magnetic clutch is energized.
3. Effective stroke is adjusted by loosening the striker and running it in or out to obtain a water flow of 14 GPM (See procedure below).
4. Adjust the throttle advance cylinder pushrod to attain 1400 engine RPM as measured with a tachometer. Tighten jam nut when final adjustment is made.
5. The setting values given are optimum and some variations in engine speeds, etc. may be necessary to obtain the specified rate of flow of water from the discharge end of the water dispensing hose.
6. Fast idle is enabled only when truck is in Park or Neutral

1.7.3 Throttle Advance For Gas Engines With Potentiometer (EFF SN 0364+)

(See 4.2.2 for Diesel engine)

1. The purpose of the throttle advance cylinder is to increase engine speed when the hydraulic pump is energized. The increase in engine speed drives the hydraulic pump, which supplies hydraulic power to the hydraulic motor.
2. The throttle advance is set with a potentiometer. Remove the fuse access panel. The potentiometer is located at the lower edge of the knee strip, directly below the steering column
3. To enable throttle advance, the following is required
 - a. set the parking brake
 - b. transmission must be in Park
 - c. foot must be off the service brake and the accelerator
 - d. brake lights must be connected and functional

- e. adjustment is made with engine running and hydraulic pump engaged by switch or foot pedal
4. Rotate the potentiometer to increase or decrease the throttle advance (fast idle speed).
5. The setting values given are optimum and some variations in engine speeds, etc. may be necessary to obtain the specified rate of flow of water from the discharge end of the water dispensing hose.
6. Fast idle is enabled only when the truck is in Park

1.7.4 Hydraulic Pressure Setting

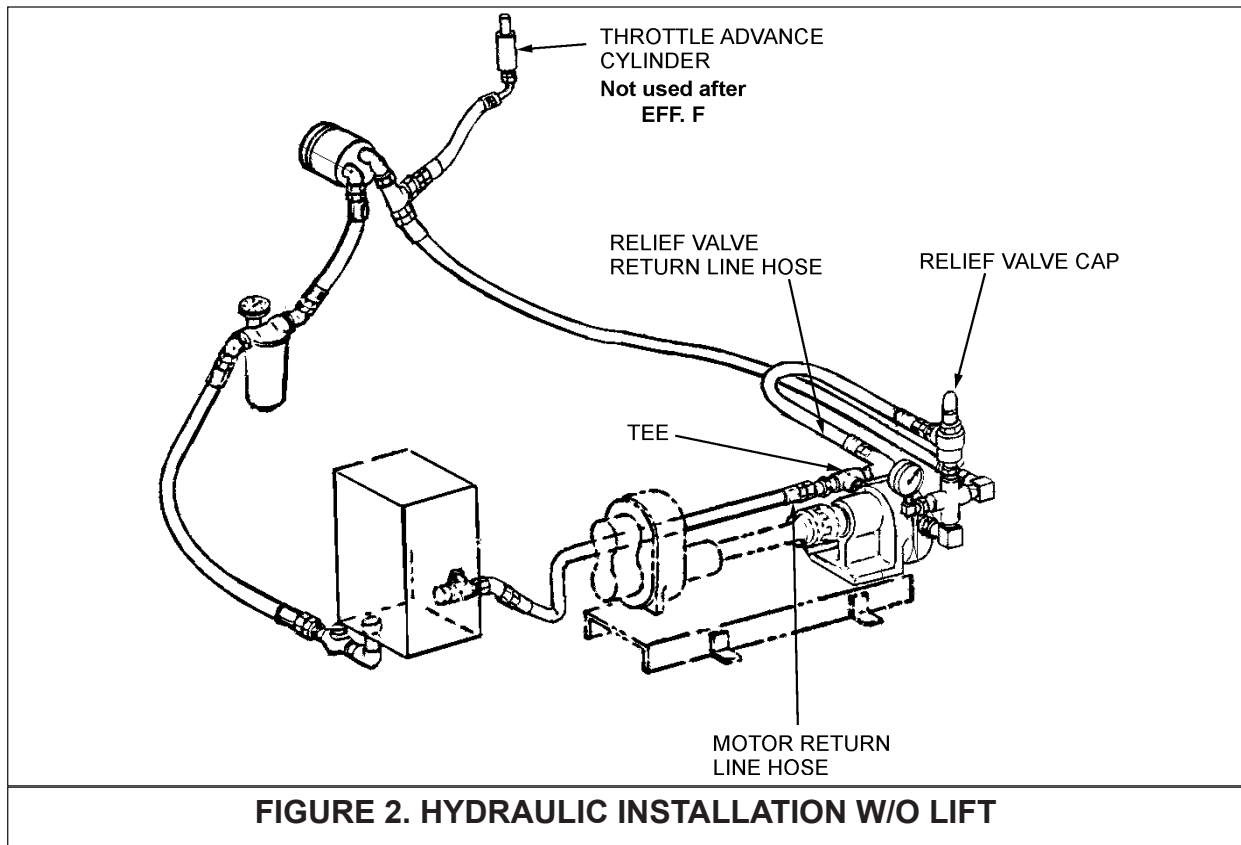
Standard System without Lift

Flow and pressure in the hydraulic system vary directly with the truck engine speed and pressure relief valve setting. The pressure relief valve is adjusted to a cracking pressure of 1200 psi.

1. Check throttle advance cylinder adjustment.
2. To adjust relief valve, disconnect hydraulic motor return line hose and relief valve return line hose from tee.
3. Remove tee from hydraulic motor.
4. Plug motor port from which tee was removed.
5. Reconnect hydraulic motor return line hose and relief valve return line hose to tee as before.
6. Cap branch outlet of tee formerly installed in motor.
7. Remove cap from pressure relief valve and loosen locknut.
8. Start truck engine.
9. With foot switch depressed to "Up" position, increase pressure by turning screw clockwise, or counterclockwise to reduce pressure. Adjust in appropriate direction until desired pressure is read on gauge.
10. Hold slotted adjustment screw in position and tighten locknut. Replace cap. Reconnect tee and hoses as before.

System with Personnel Lift

1. Put shift lever in park or neutral, set parking brake and start engine.
2. Position lift switch to up and hold.
3. Read pressure gauge to determine current relief valve setting. If a reading of 1500 psi is not obtained, proceed with the following steps.



4. Remove cap from pressure relief valve and loosen locknut. (Note: with top mounted lift, the relief valve is in the directional control valve.)
5. Start truck engine.
6. Position lift switch to up and hold.
7. Increase pressure by turning screw clockwise, or counterclockwise to decrease pressure.
8. Set relief valve at 1500 psi, tighten locknut and replace cap.

1.7.5 Maintenance Safety for Optional Rear Bumper Lift

Observe all safety precautions in this manual and on the decals applied to the machine and shown in the parts section for this option.

⚠ DANGER Be sure that all persons are clear of the unit and away from possible pinch points while lowering or raising the lift. People or limbs can become entangled in the scissors assemblies resulting in serious injury or death.

Whenever servicing the lift in a raised position, be sure to move the maintenance pipe (round bar) from the storage position to the lock position. See figure 3.

1.7.6 Potable Water Dispensing System

A Pressure Relief valve is installed in the water system to protect the aircraft plumbing system from excessive pressure. The relief valve is adjusted to deliver a maximum pressure of 25 PSI to the aircraft. A pressure switch (set at 42 PSIG) is provided as a backup to the relief valve. The pressure switch will disengage the pump clutch in event the relief valve fails to open properly. All adjustments are made with NO flow.

1. Place plug in coupling at end of hose.
2. Screw in relief valve to raise pressure to about 50 PSI.
3. Remove cover and turn adjusting screw until system starts to chatter (due to the clutch cycling on and off at 42 PSI).
4. Replace cover.
5. Adjust relief valve to 25 PSI.
6. Flow Test - Water

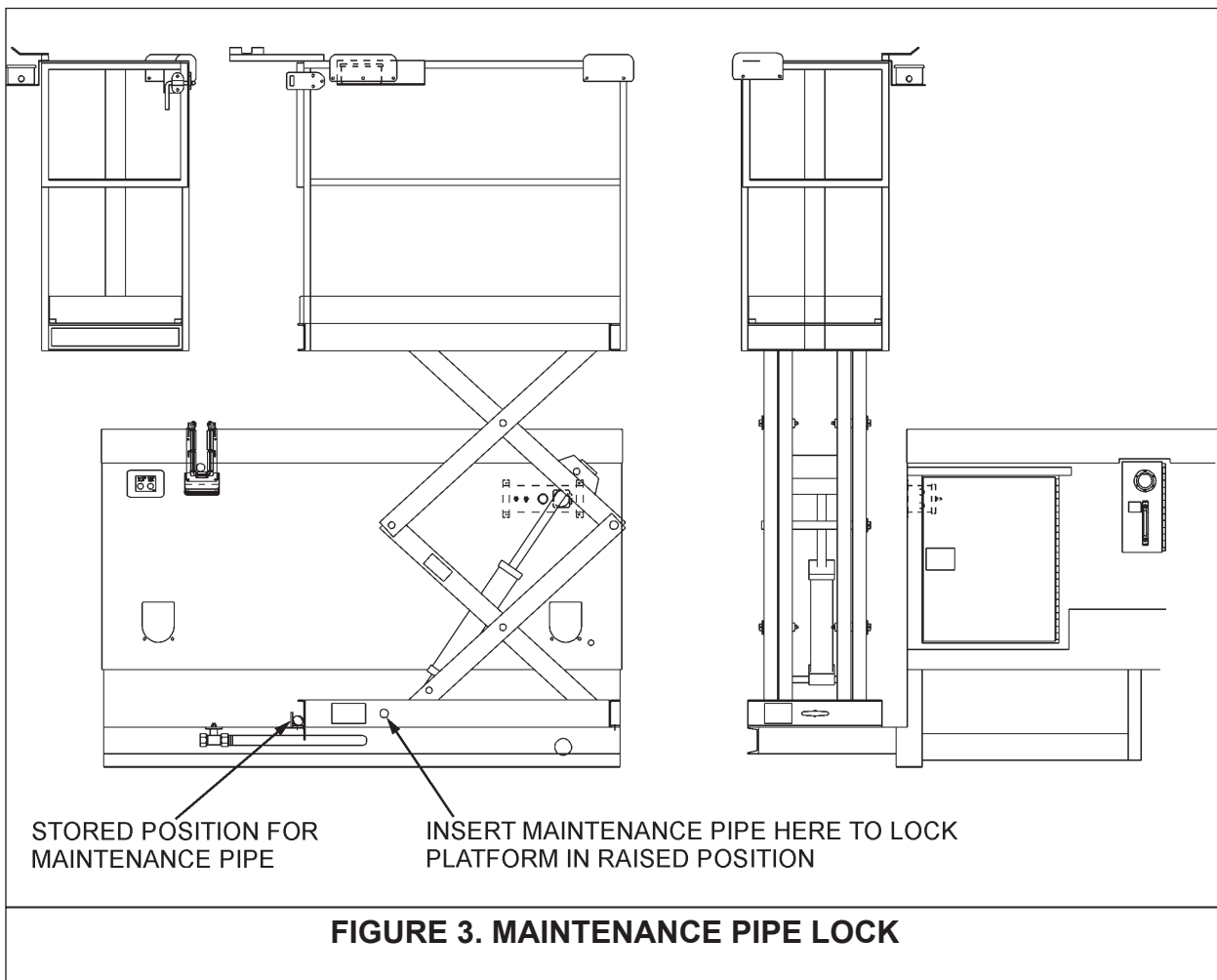


FIGURE 3. MAINTENANCE PIPE LOCK

Checking Flow Rate

Tools required: Stop watch and a container of known capacity (5-30 gallons).

Flow is found by timing the fill of the container. For example, if a 5 gallon container fills in 20 seconds (1/3 of a minute) then the required 14 gallons per minute is flowing (4.7 gal. per 20 seconds.).

NOTE: A flow meter can be used instead of the container and watch.

NOTICE! We do not recommend exceeding 1500 RPM engine speed as this may result in damage to hydraulic pump due to excessive inlet flow.

Adjusting Flow Rate

Change flow rate by adjusting the throttle advance. Do not use the pressure setting to adjust flow rate.

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2 TROUBLE SHOOTING

⚠ WARNING Perform lockout/tagout procedures before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could cause serious injury or death.

2.1 PROBABLE CAUSE AND REMEDIES-HYDRAULIC

PROBLEM	POSSIBLE CAUSE	REMEDY
Insufficient or no hydraulic power.	Magnetic clutch on pump not engaged.	Check wiring and connections for security and continuity and repair as required
		Check ACC fuse and replace if necessary
	Relief valve defective or out of adjustment	Adjust, repair or replace valve (see Chapter 2, Section 4)
Hydraulic drive motor runs slow and/or erratic.	Drive belt to pump clutch slipping or broke.	Tighten or replace serpentine drive belt
	Drain valve open.	Close drain valve.
	Gate valve partially open.	Open valve fully.
	Filter clogged or defective.	Replace filter.
	Low or no hydraulic oil in system.	Fill hydraulic oil tank to proper level using filler cap dipstick. Use only Mobil DTE-13 or equivalent.
	Defective clutch on pump.	Replace clutch.
	Defective hydraulic pump.	Repair or replace pump.
	Defective hyd. pump drivemotor	Repair or replace motor.
	Faulty throttle cylinder	Replace cylinder.
	Defective solenoid control valve (units with personnel lift)	Repair or replace valve.
	Defective solenoid on control valve (units with personnel lift)	Replace solenoid.
Immersion or space heaters do not heat.	No electric power.	External pwr cord not plugged in
	Defective wiring, terminals, etc.	Check system for continuity through extension cable to heaters. Repair as required.
	Defective heater.	Replace heater.
Hot water heater fan does not operate	Defective fan, switch, wires, or connections	Repair or replace as required.

PROBLEM	POSSIBLE CAUSE	REMEDY
Lift does not actuate up or down on command.	Hydraulic system malfunction.	See above
	Defective solenoid control valve.	Replace solenoid or complete valve
	Defective control switches.	Replace switch.
	Defective lift cylinder.	Repair or replace cylinder.
	Gate valve closed.	Open valve.
	Throttle advance cylinder defective or linkage improperly adjusted	Repair or adjust linkage or cylinder
	Lift mechanism binding, possibly caused by misalignment, worn pivot components, frozen bearings, or broken components.	Isolate cause and repair. NOTE: The lift cylinder exerts a powerful force. If found jammed by foreign objects, always carefully inspect assembly for damage.
Flush water pumping system does not pump water or water flow too slow	No water in system.	Fill flush water tank.
	No hydraulic power.	See previous page.
	No electrical power.	Check for blown fuse or truck alternator/battery problem
	Defective water pump or magnetic clutch.	Repair or replace pump.
	Defective or out-of-adjustment flush water pressure relief valve.	Adjust, repair, or replace valve. See ADJUSTMENTS later in this chapter
	Defective flush water flow meter.	Repair or replace flow meter.
	Defective coupling between drive motor and water pump.	Replace coupling.
	Defective or improperly adjusted throttle advance cylinder	Replace or adjust cylinder. See ADJUSTMENTS later in this chapter
	Defective control wiring, switch, or connection	Repair as required

2.2 SCHEMATICS

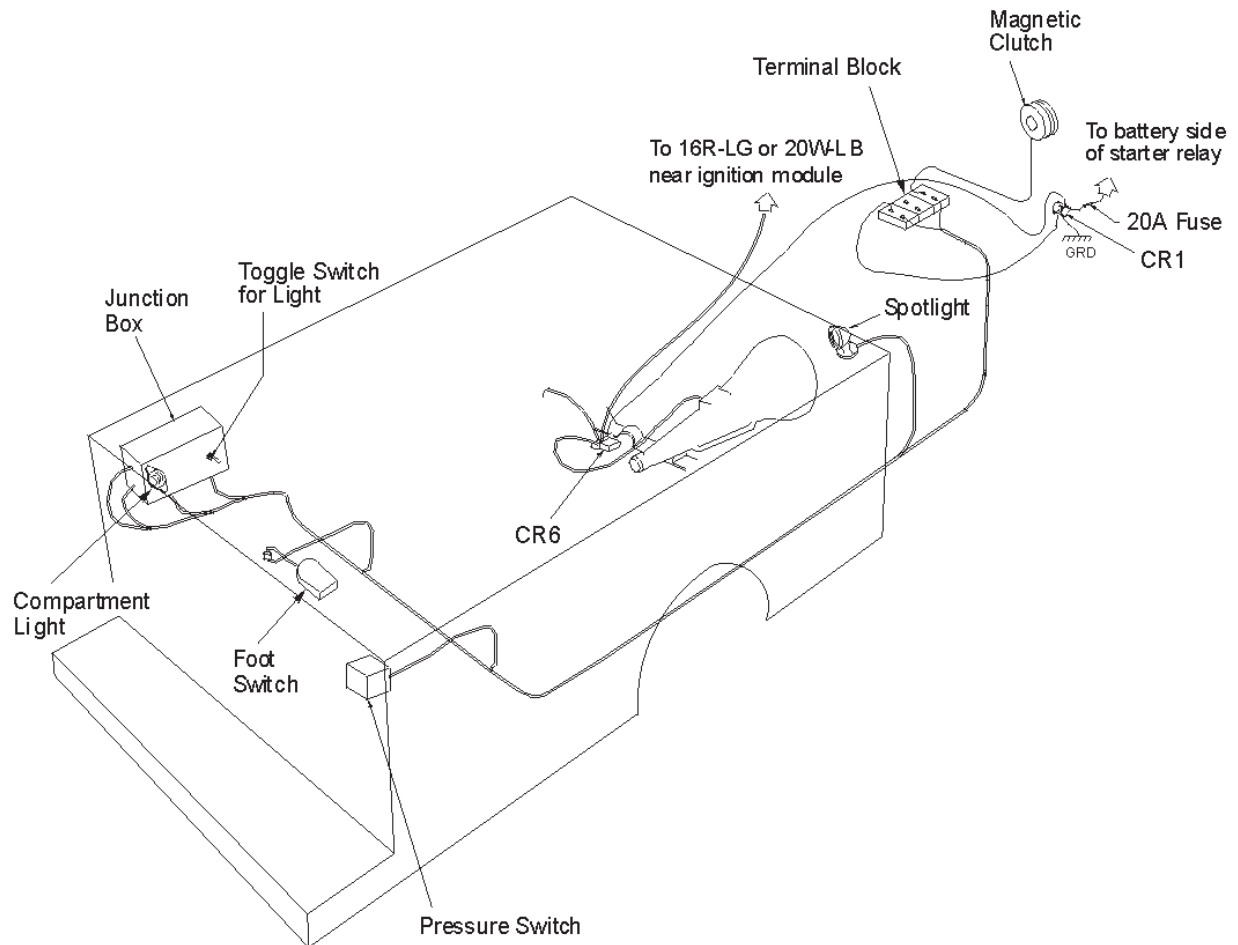


FIGURE 1. ELECTRICAL INSTALLATION - 96/97

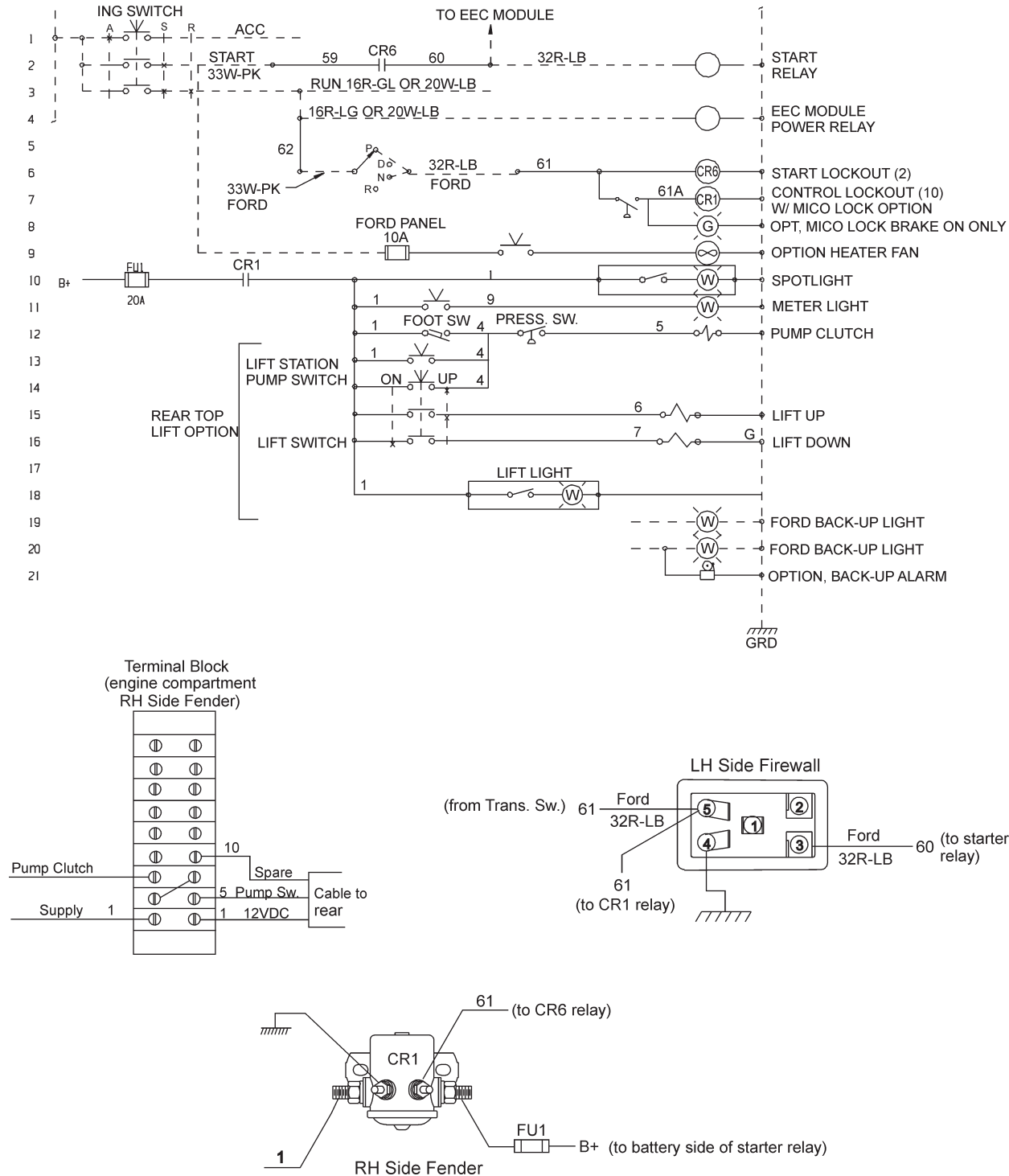


FIGURE 2. 4-ELECTRICAL SCHEMATIC AND WIRING - 96/97

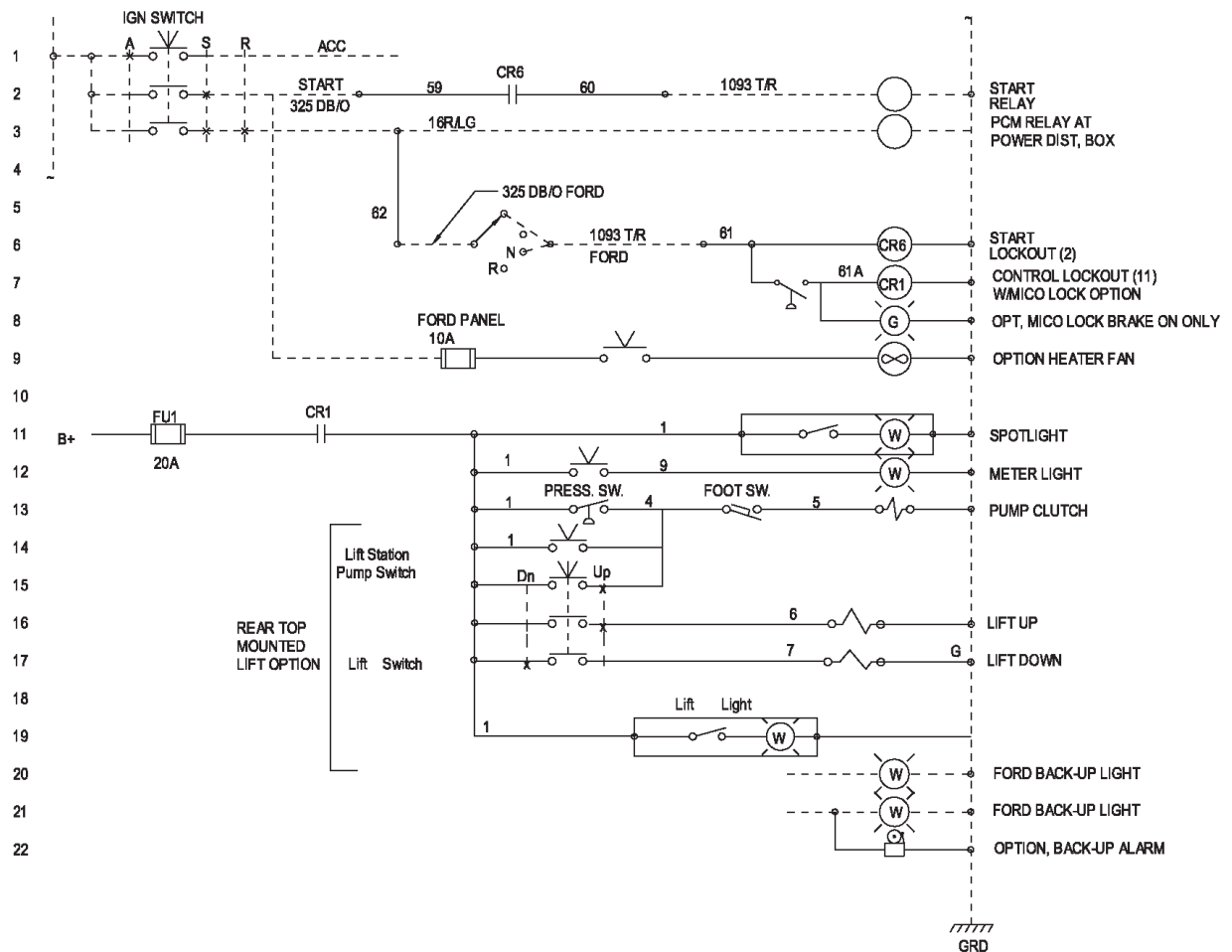
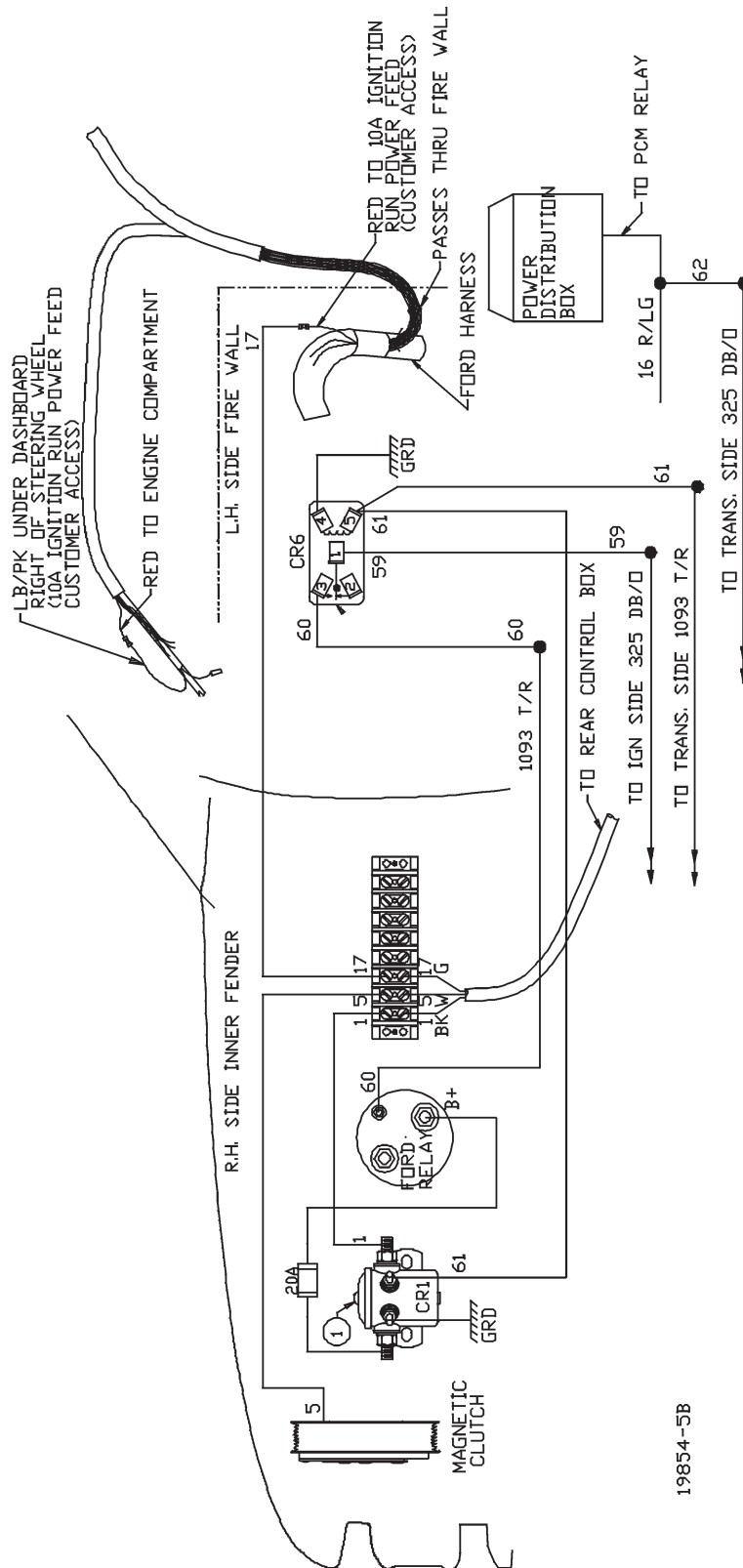


FIGURE 3. ELECTRICAL SCHEMATIC 99 & LATER



19854-5B

FIGURE 4. WIRING INSTALLATION, ENGINE COMPARTMENT, 99 & LATER

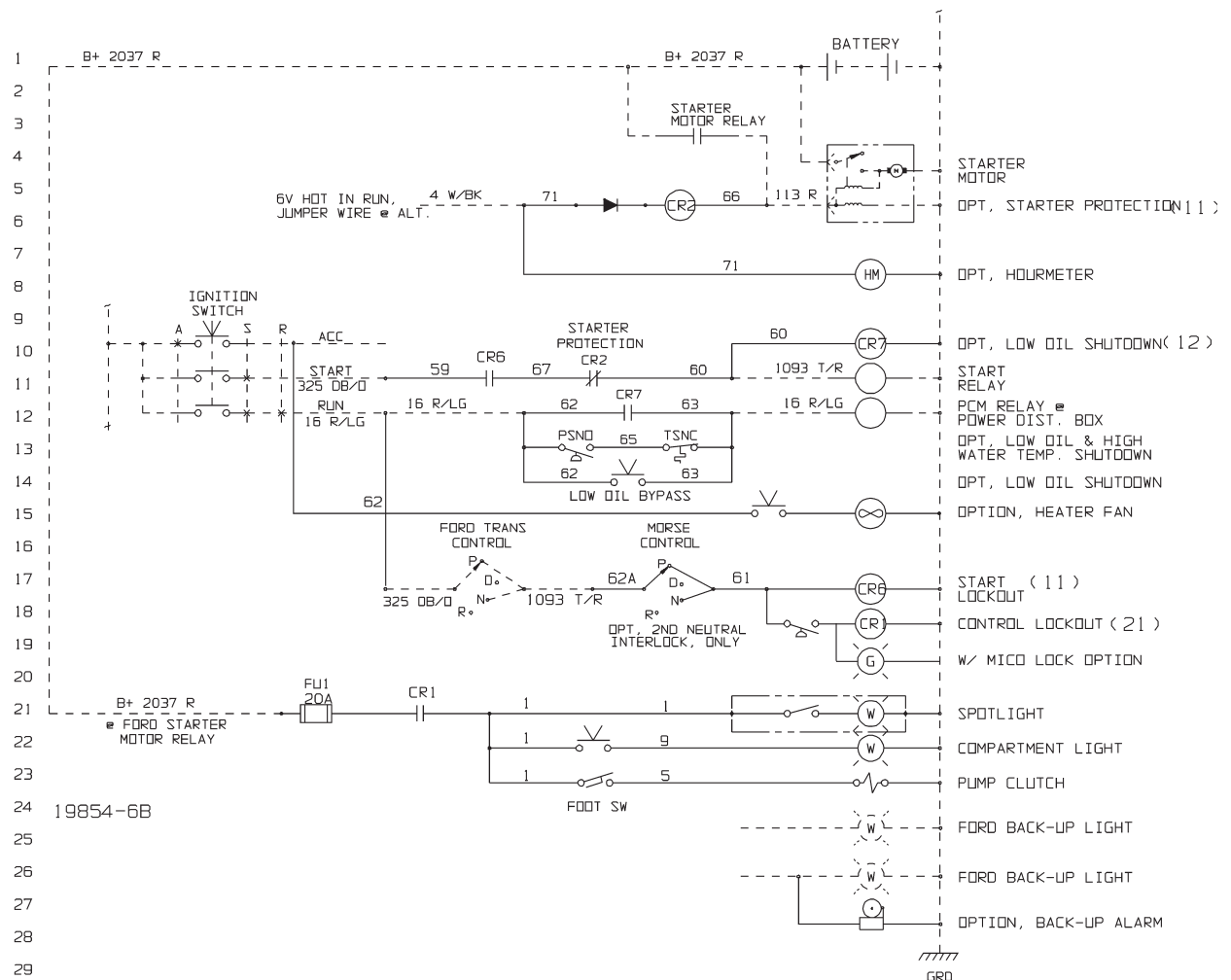


FIGURE 5. GAS, MULTIPLE OPTION ELECTRICAL SCHEMATIC, 99 & LATER

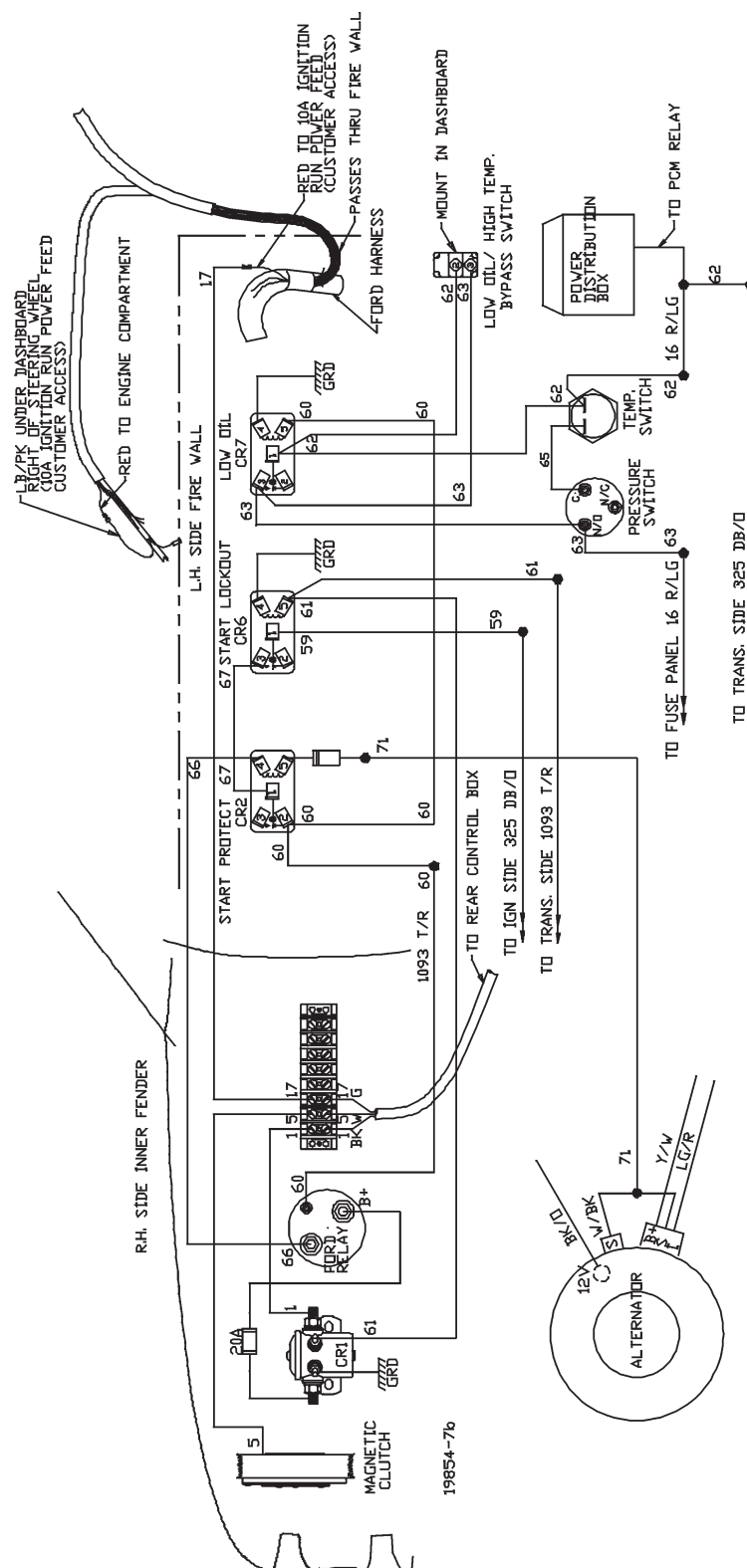


FIGURE 6. GAS, MULTIPLE OPTION WIRING DIAGRAM

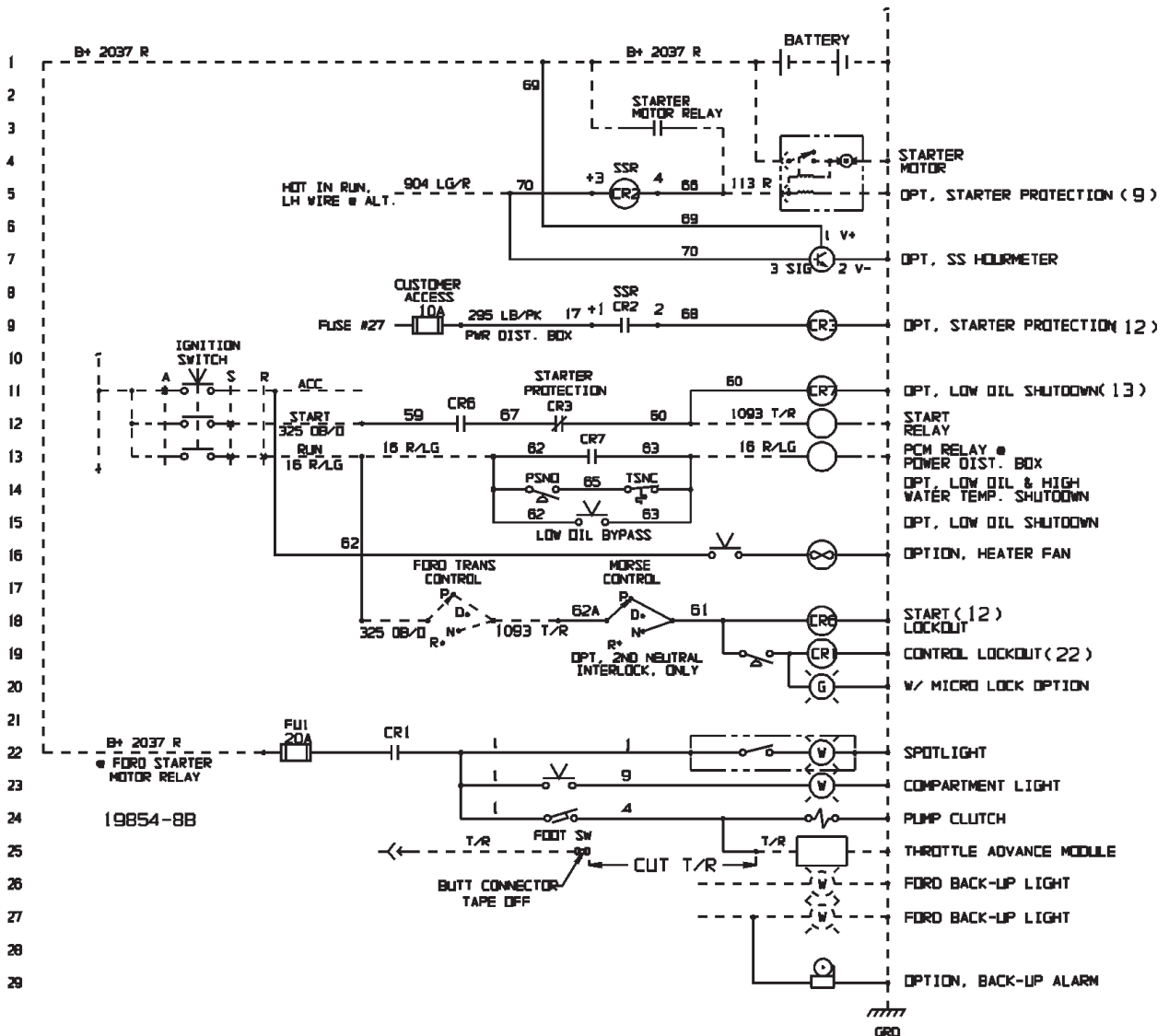


FIGURE 7. DIESEL, MULTIPLE OPTION ELECTRICAL SCHEMATIC, 99 & LATER

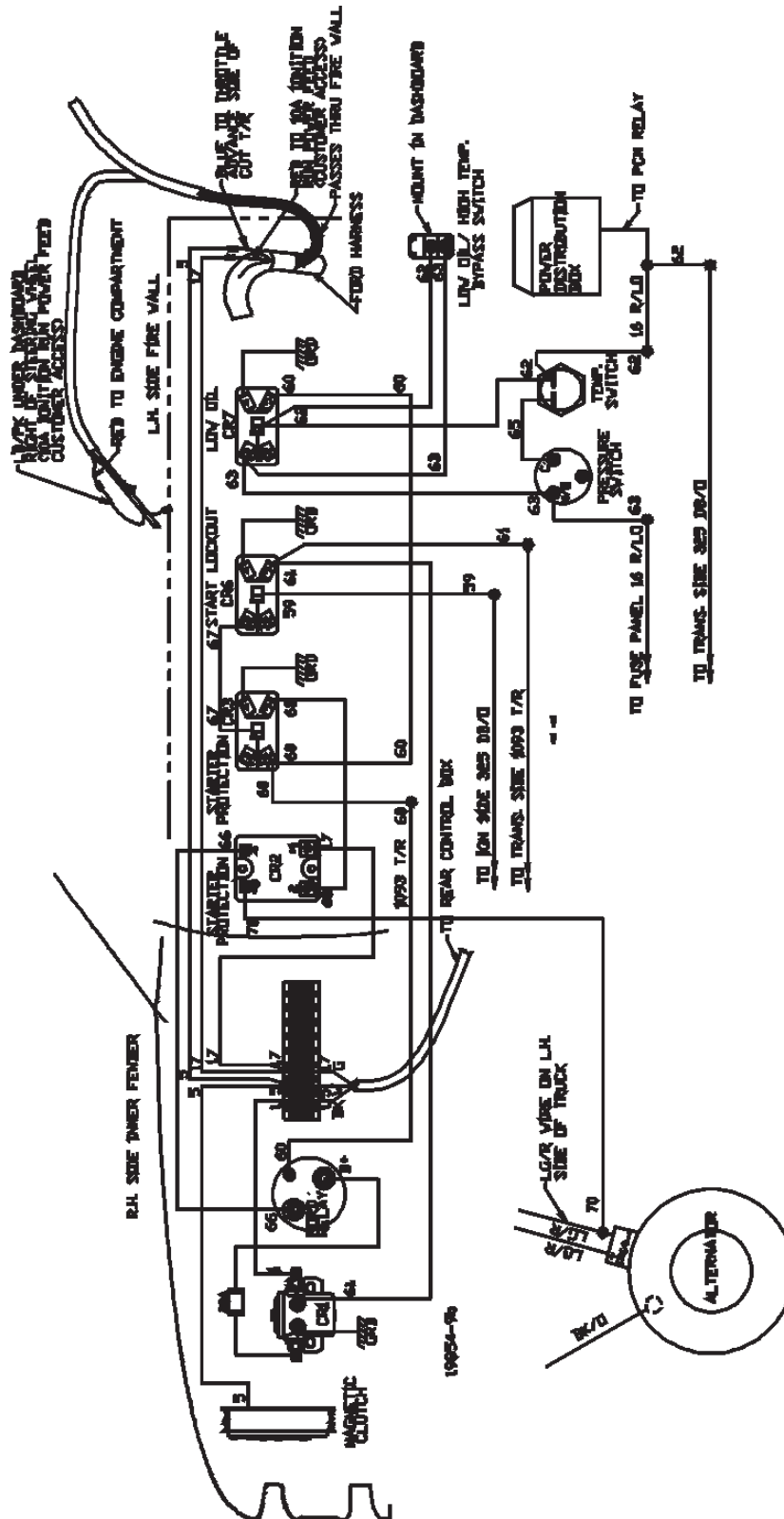


FIGURE 8. DIESEL, MULTIPLE OPTION, WIRING DIAGRAM, 99 & LATER

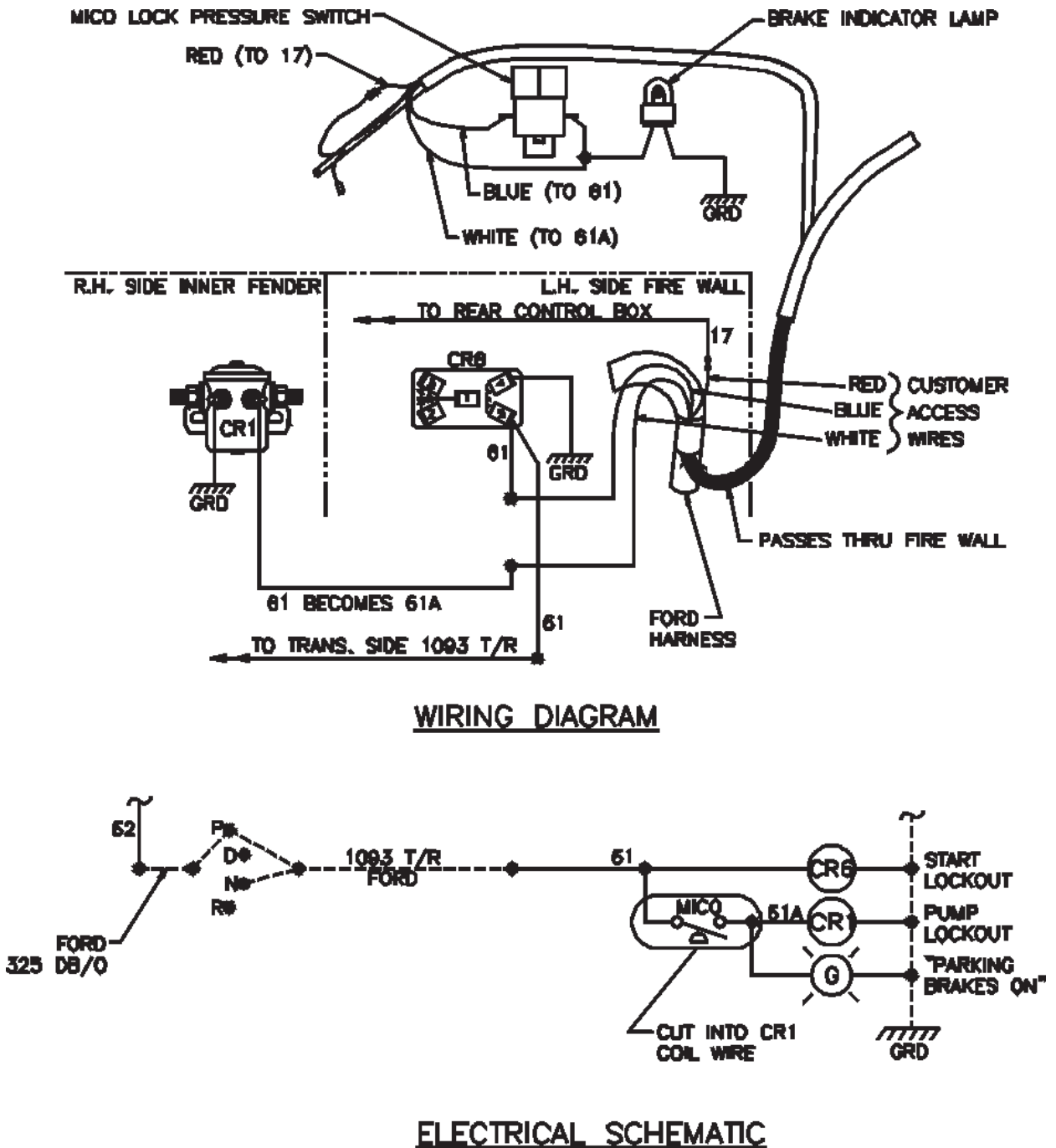


FIGURE 9. MICO LEVER BRAKE OPTION, 99 & LATER

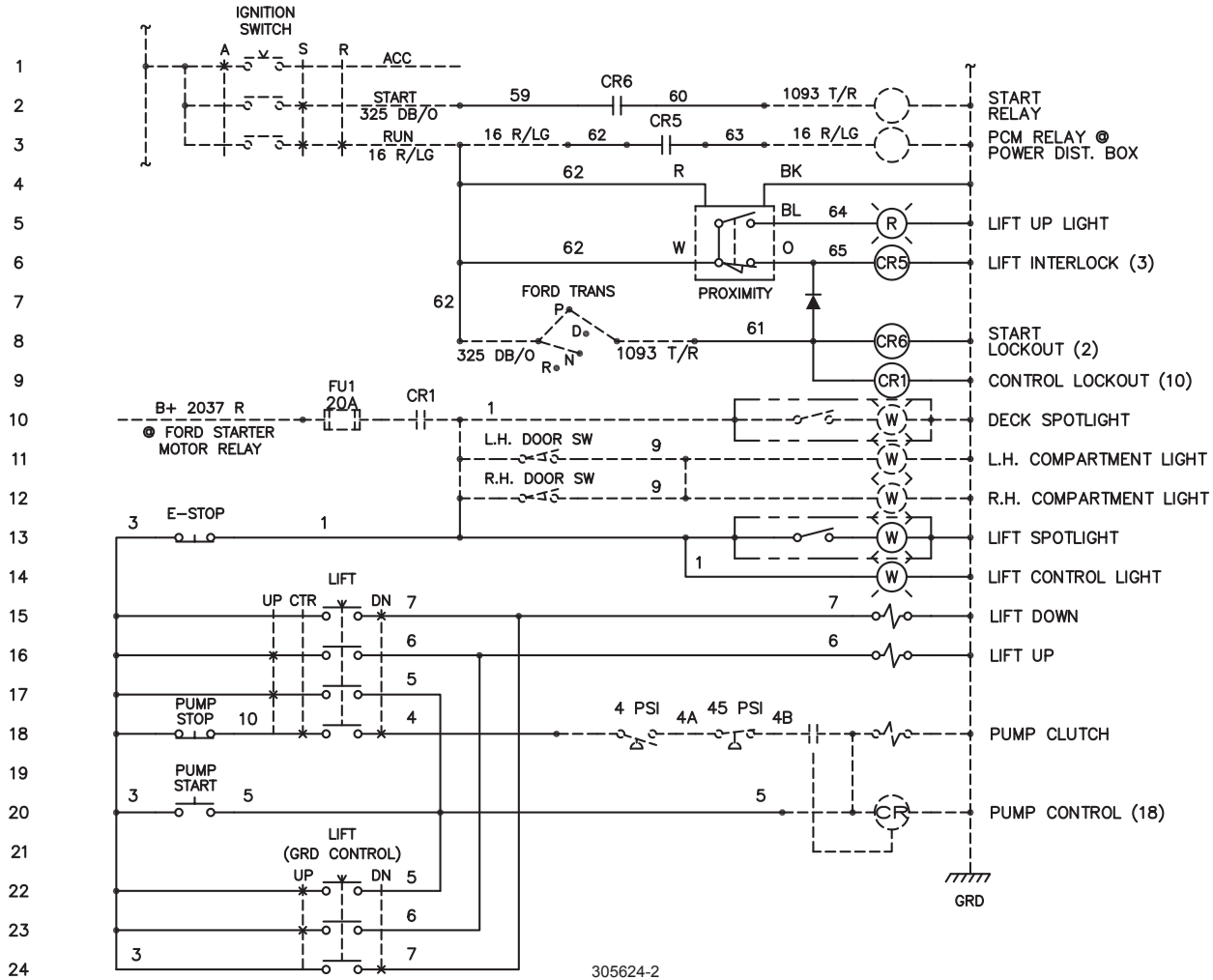


FIGURE 10. ELECTRICAL SCHEMATIC, OPTIONAL, REAR BUMPER LIFT, 1999-2004

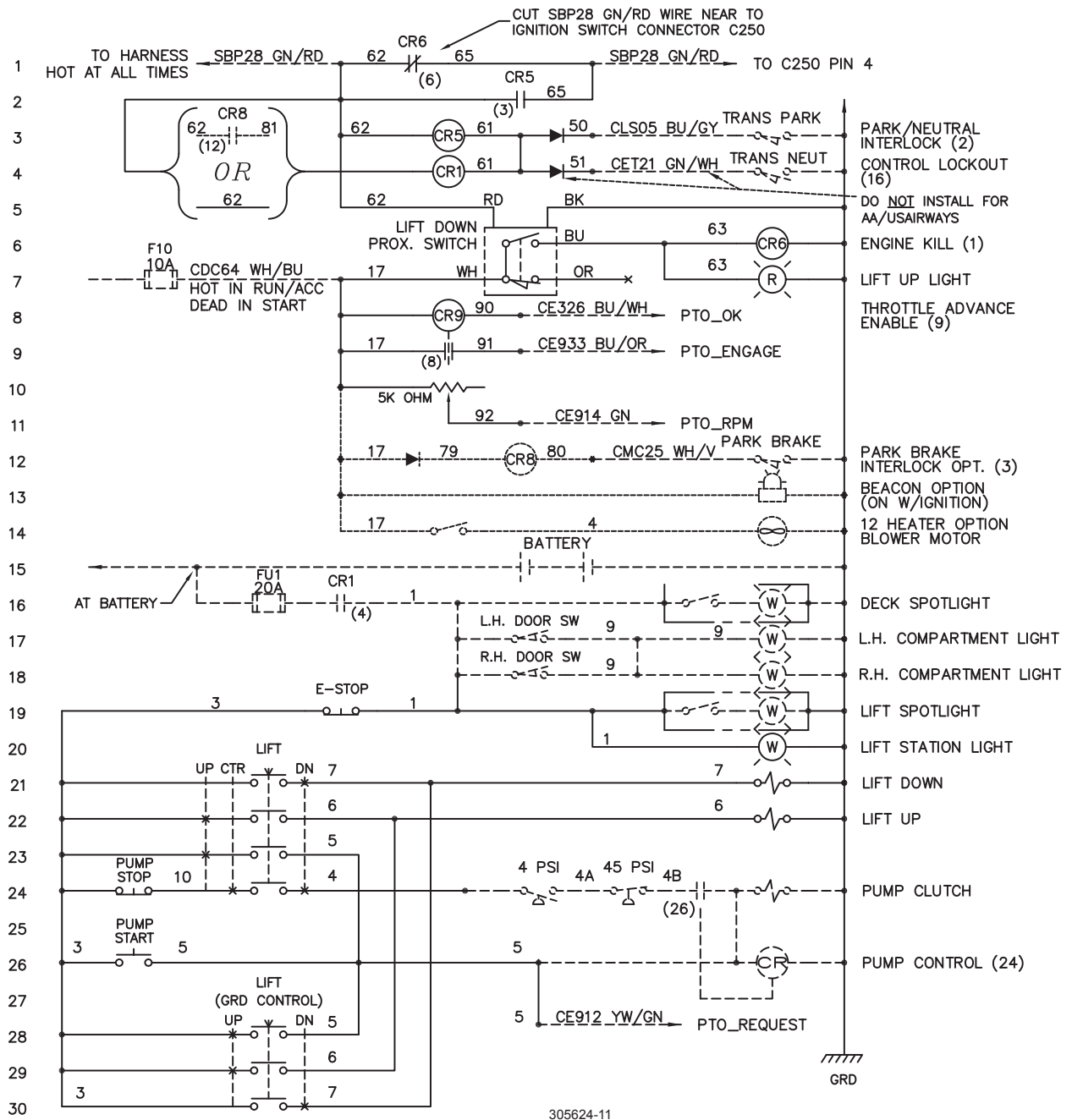
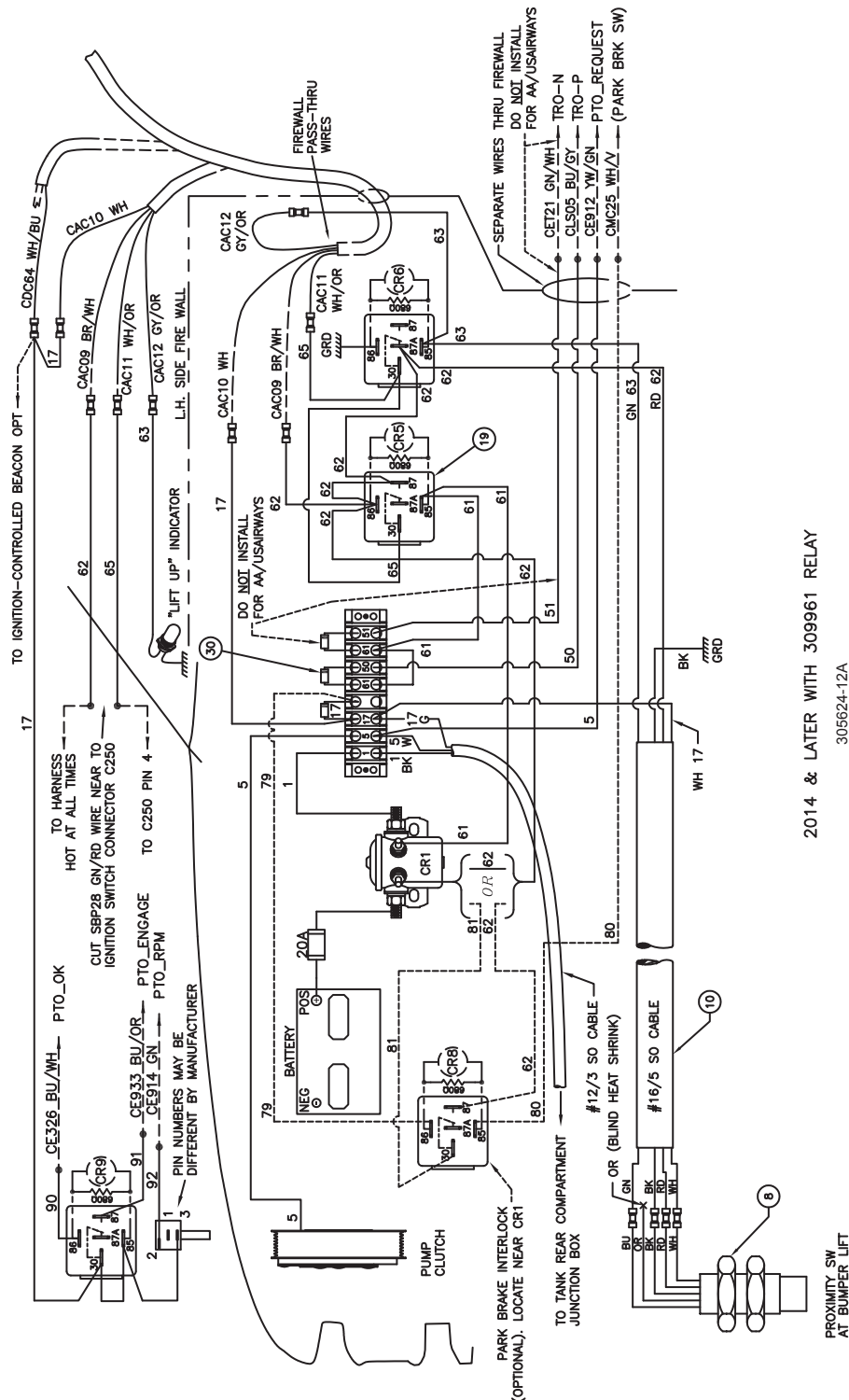
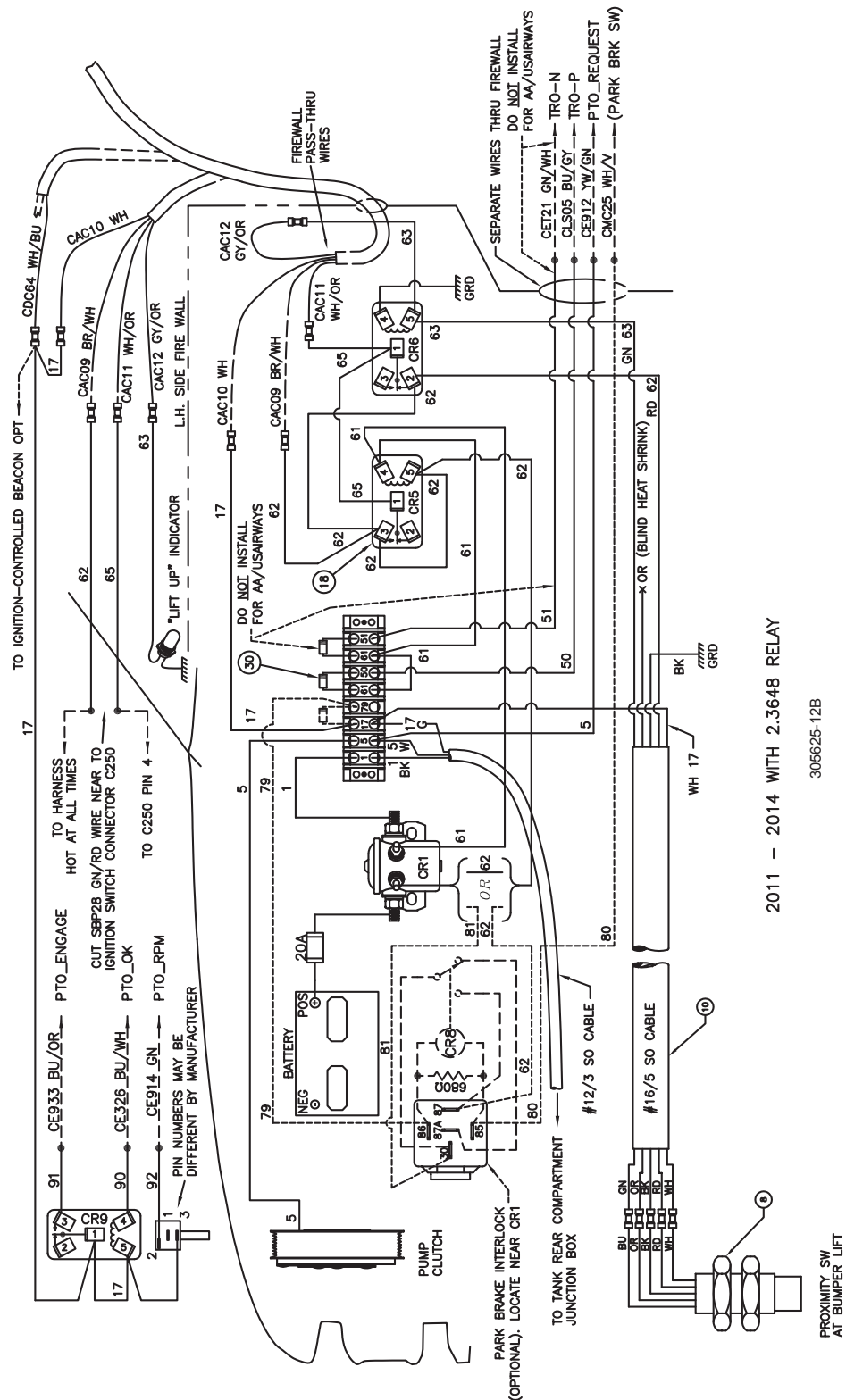


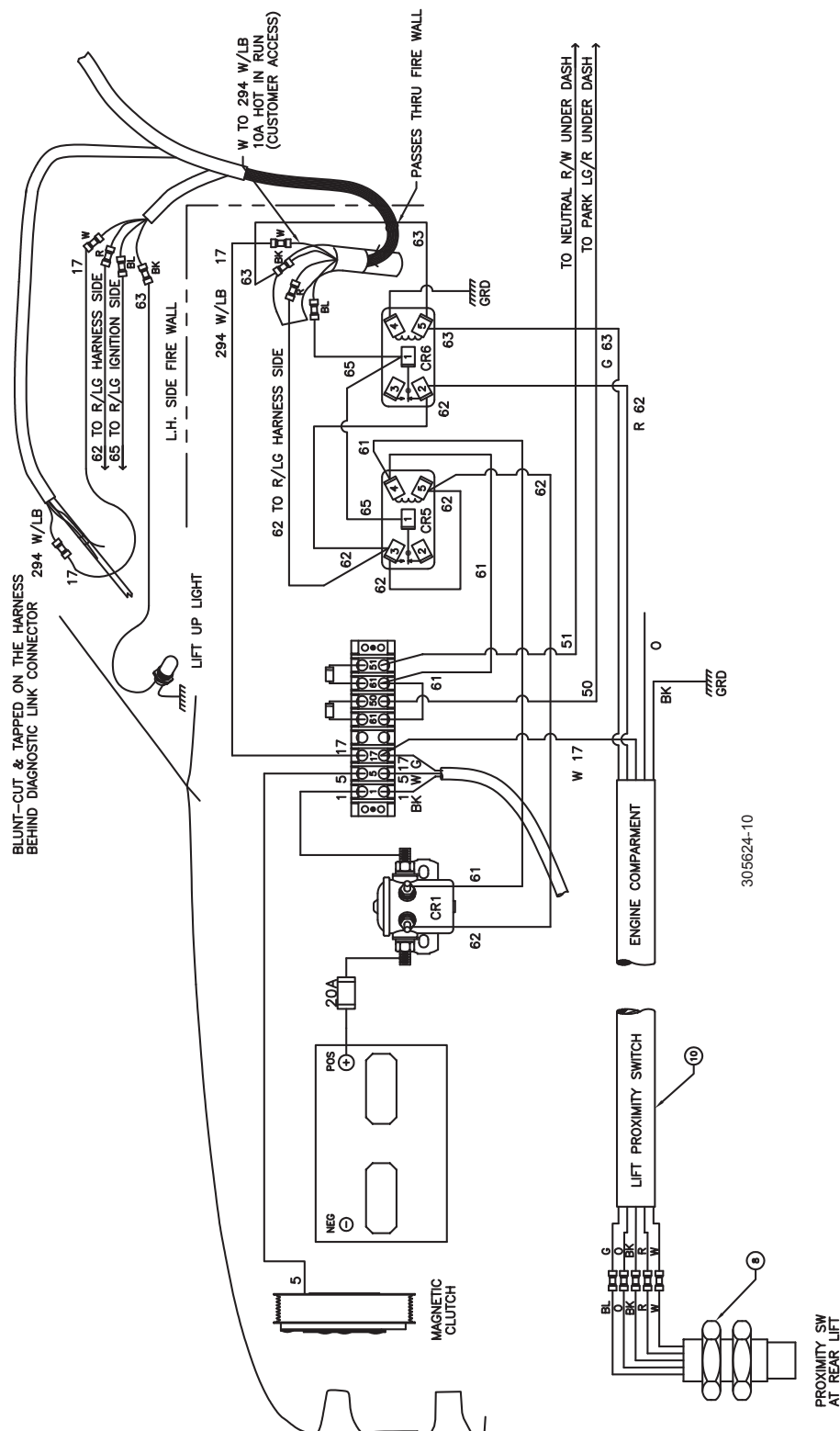
FIGURE 11. ELECTRICAL SCHEMATIC, OPTIONAL, REAR BUMPER LIFT, EFF J, 2011 +



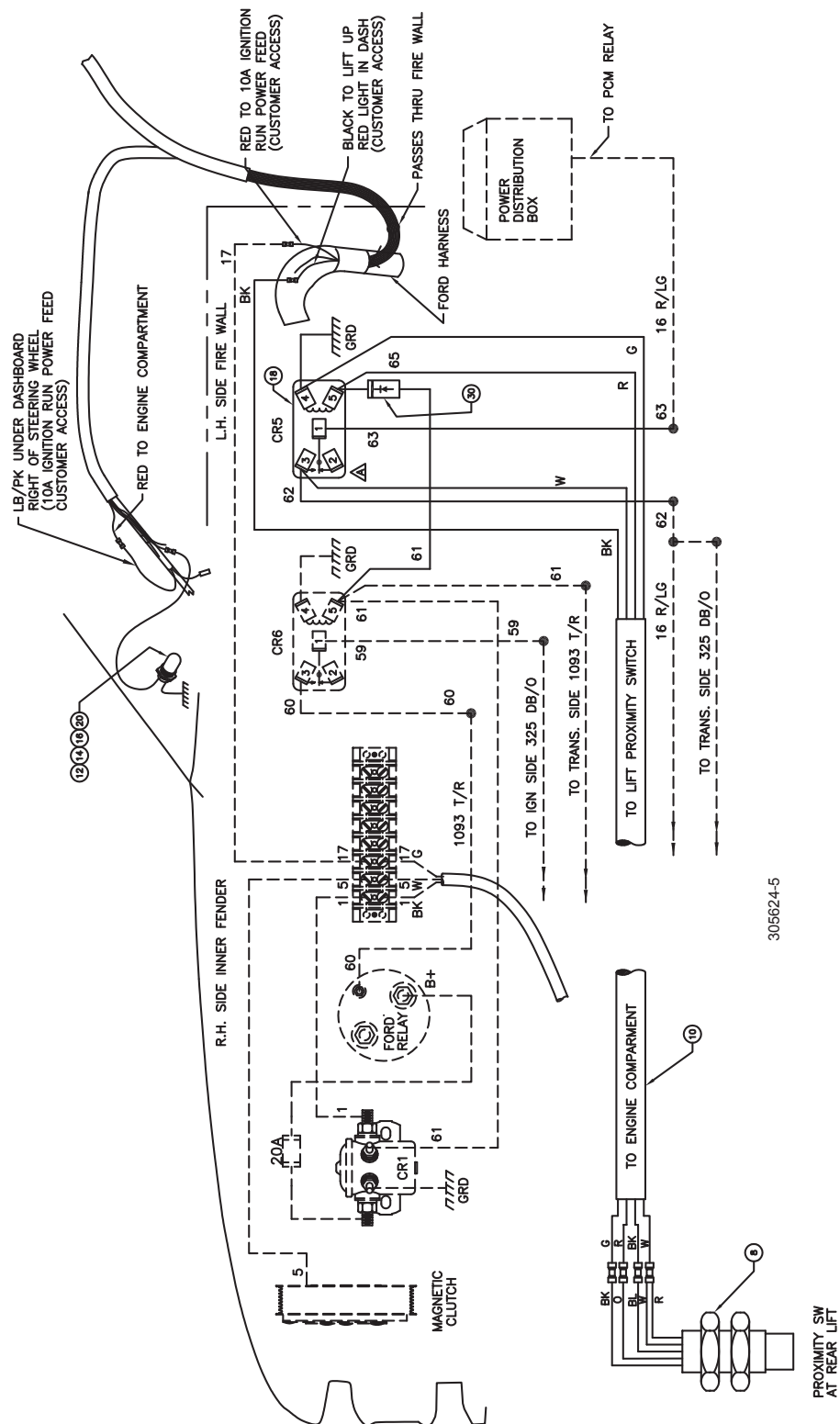
**FIGURE 12. ELECTRIC INSTALL., ENGINE COMP. LIFT INTERLOCK, OPTIONAL,
REAR BUMPER LIFT, EFF J, 2014+**



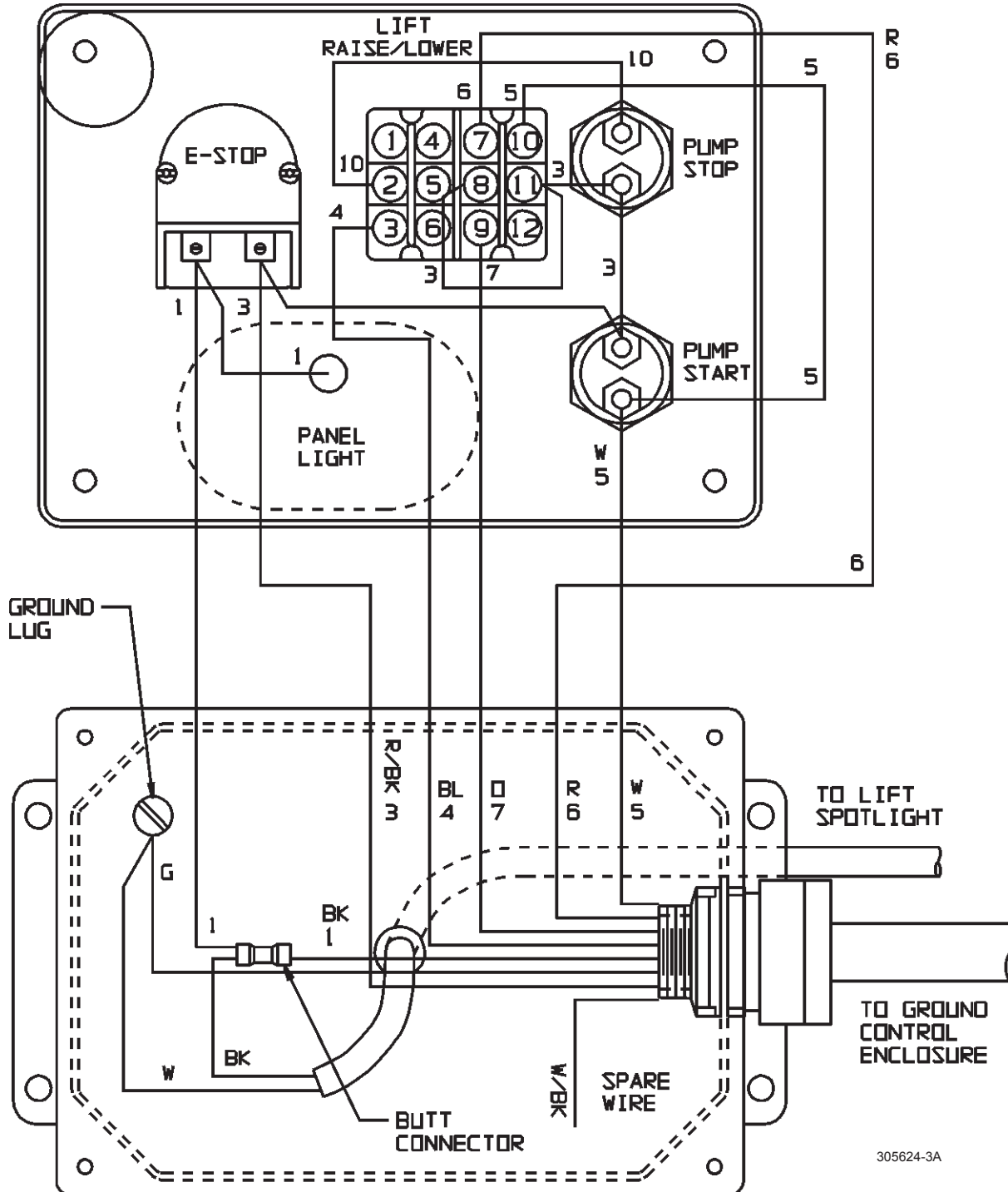
**FIGURE 13. ELECTRIC INSTALL., ENGINE COMP. LIFT INTERLOCK, OPTIONAL,
REAR BUMPER LIFT, EFF J, 2011-2014**



**FIGURE 14. ELECTRIC INSTALLATION, ENGINE COMP. LIFT INTERLOCK
OPTIONAL, REAR BUMPER LIFT, 2005-2010**



**FIGURE 15. ELECTRIC INSTALLATION, ENGINE COMP. LIFT INTERLOCK,
OPTIONAL, REAR BUMPER LIFT, 1999-2004**



305624-3A

FIGURE 16. WIRING, LIFT CONTROL, OPTIONAL, REAR BUMPER LIFT

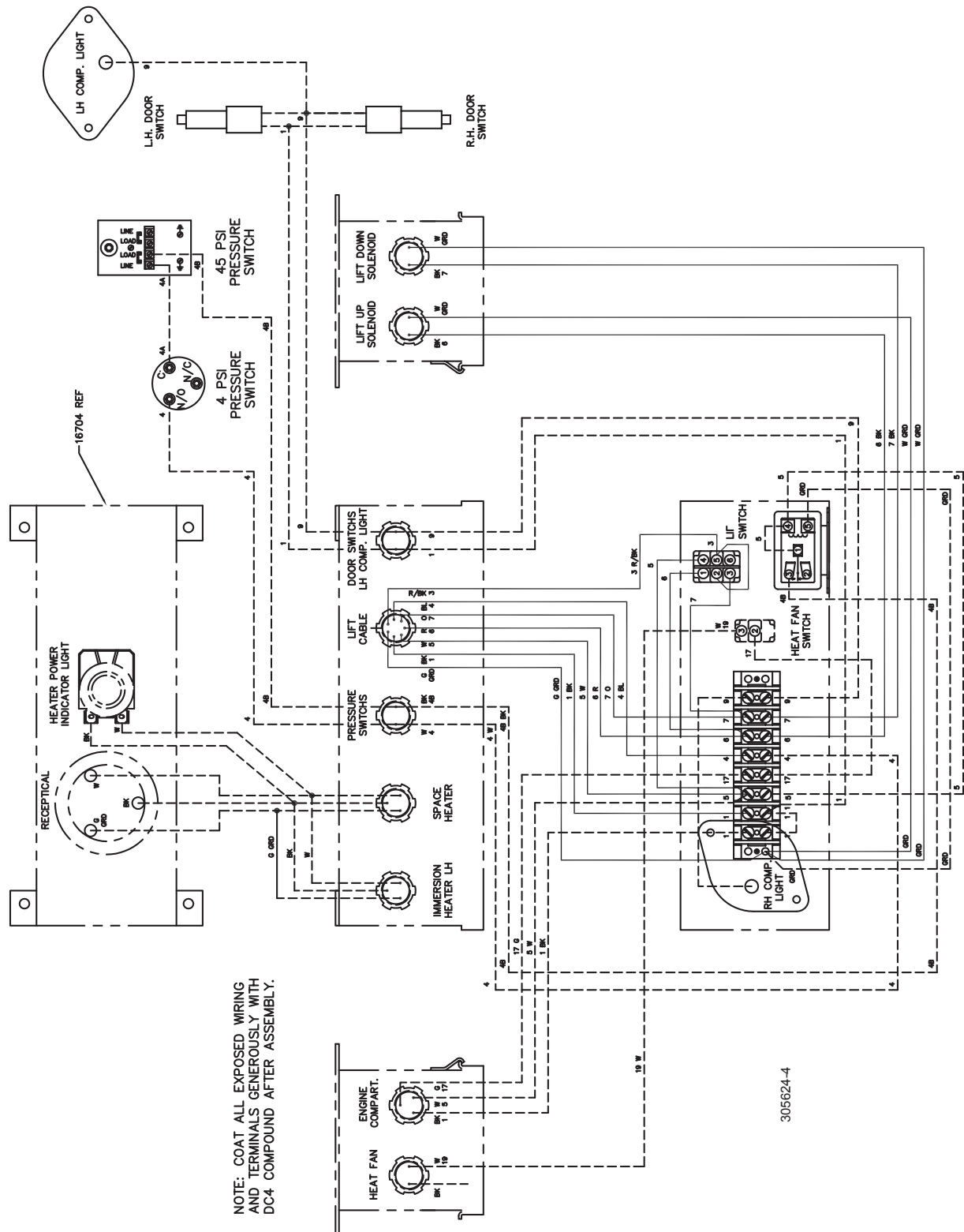


FIGURE 17. WIRING DIAGRAM, GROUND CONTROL, OPTIONAL, REAR BUMPER LIFT

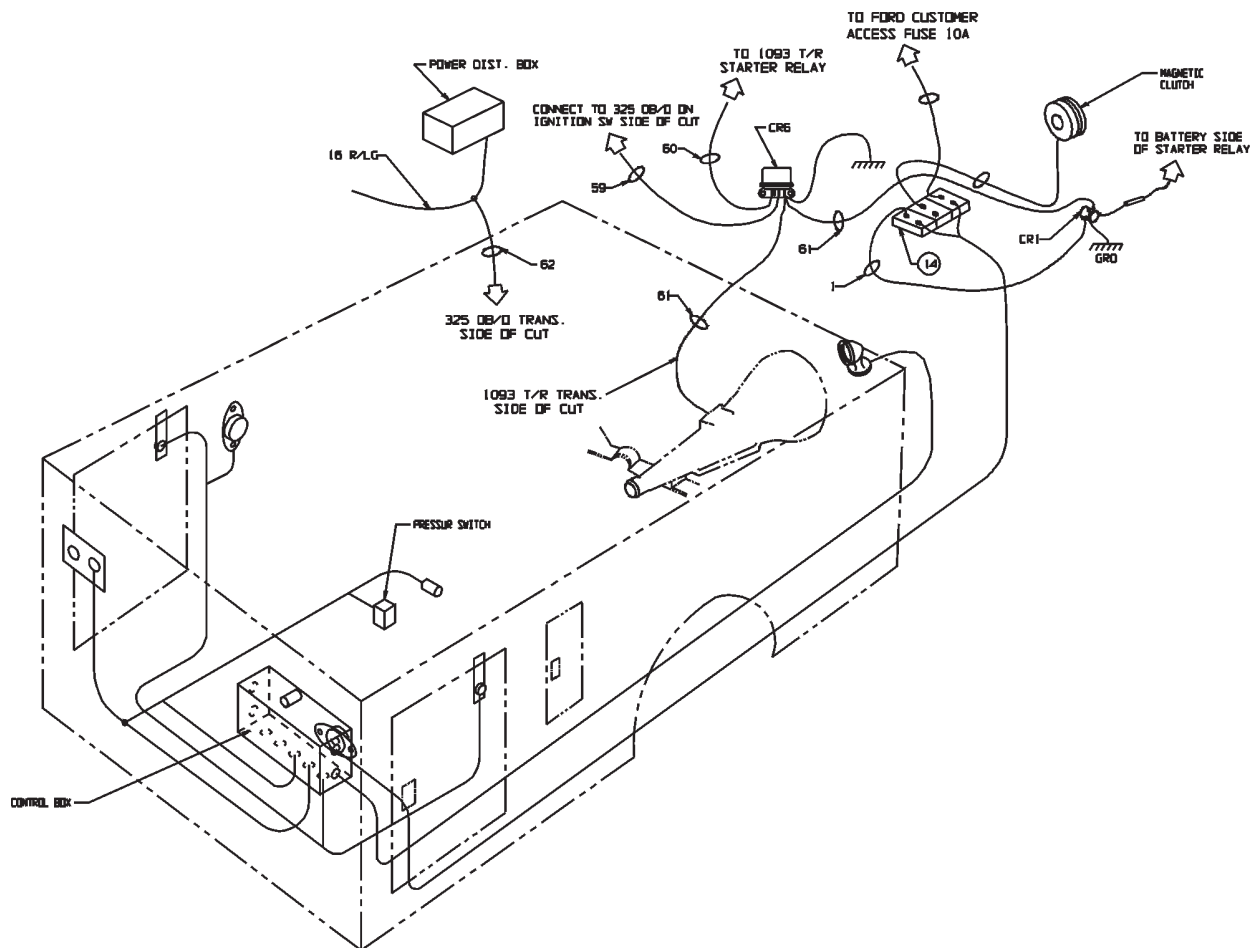


FIGURE 18. ELECTRIC INSTALLATION, SIDE COMPARTMENT DOORS W/O LIFT

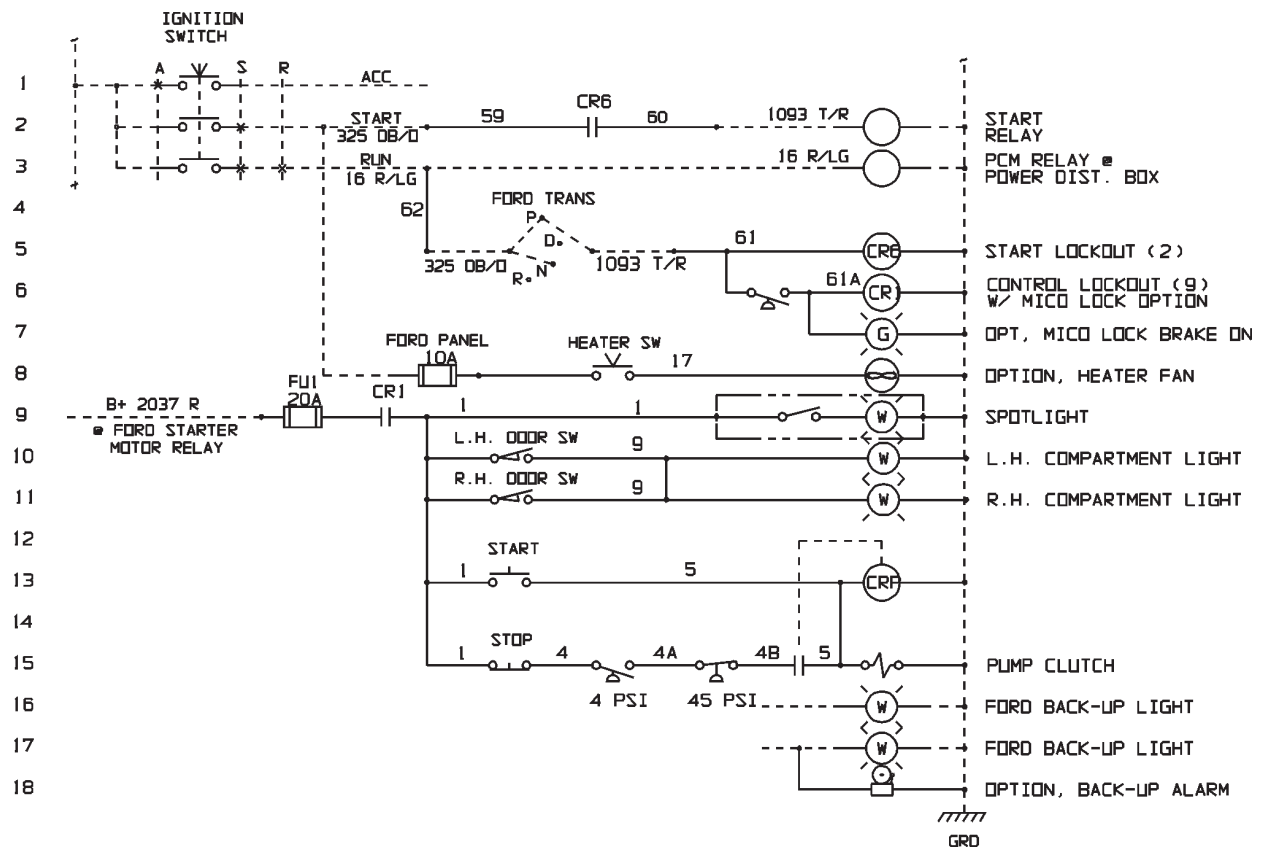
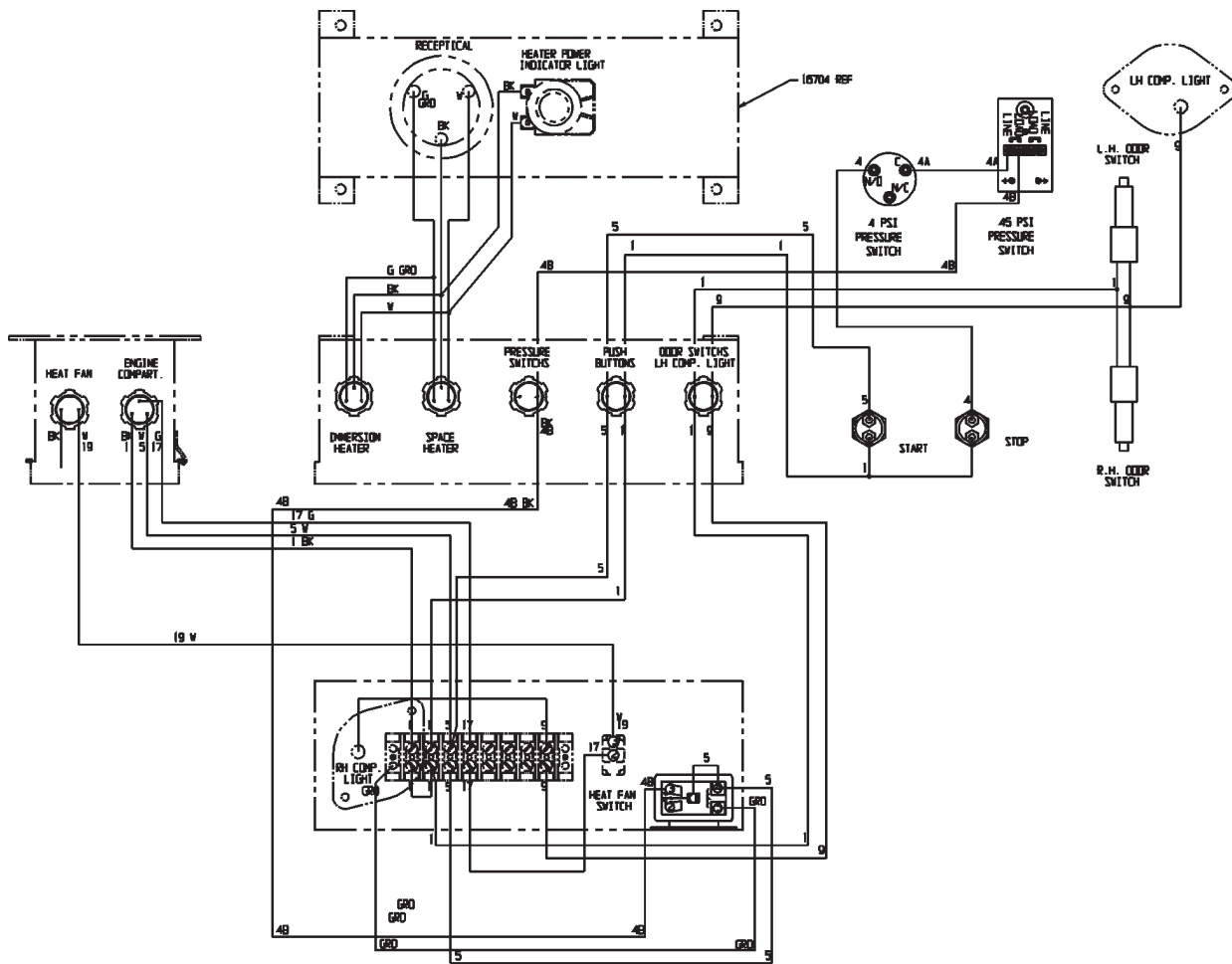
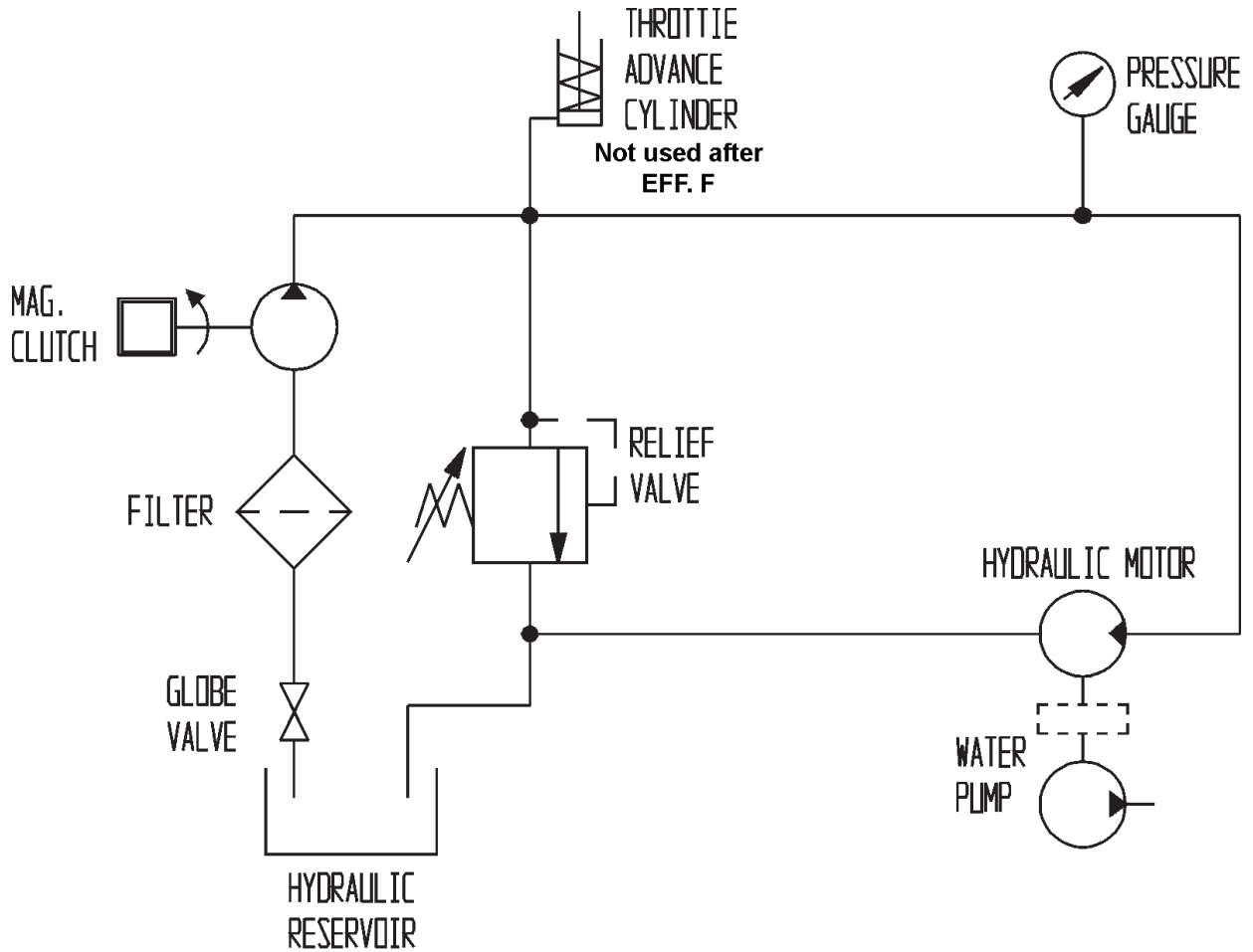


FIGURE 19. ELECTRIC SCHEMATIC, SIDE COMPARTMENT DOORS W/O LIFT



**FIGURE 20. ELECTRIC INSTALLATION DIAGRAM, SIDE COMPARTMENT DOORS
W/O LIFT**



HYDSCHM-402

FIGURE 21. STANDARD HYDRAULIC CIRCUIT

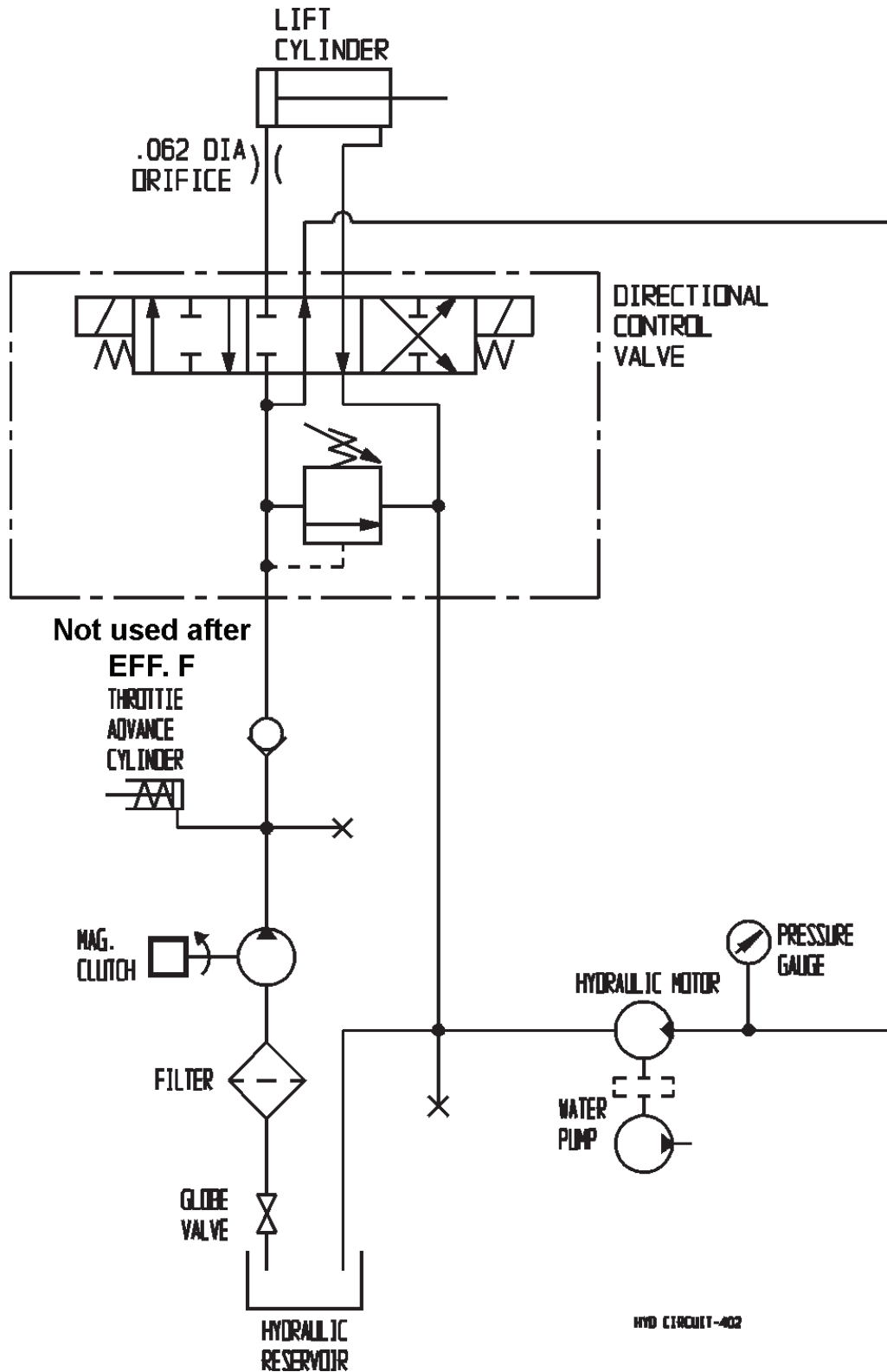


FIGURE 22. HYDRAULIC CIRCUIT WITH TOP MOUNTED LIFT OPTION

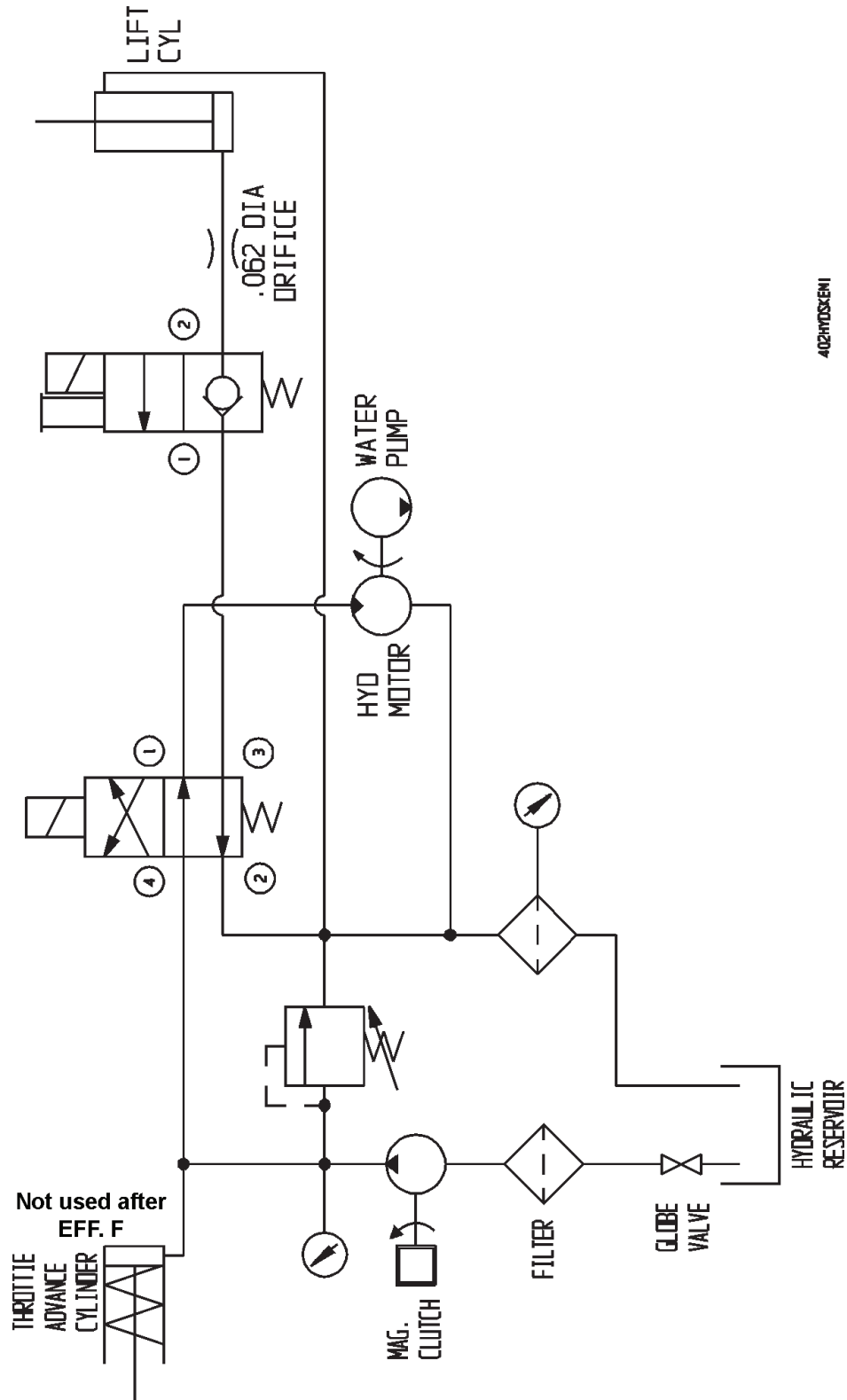


FIGURE 23. HYDRAULIC CIRCUIT W/ REAR BUMPER LIFT OPTION

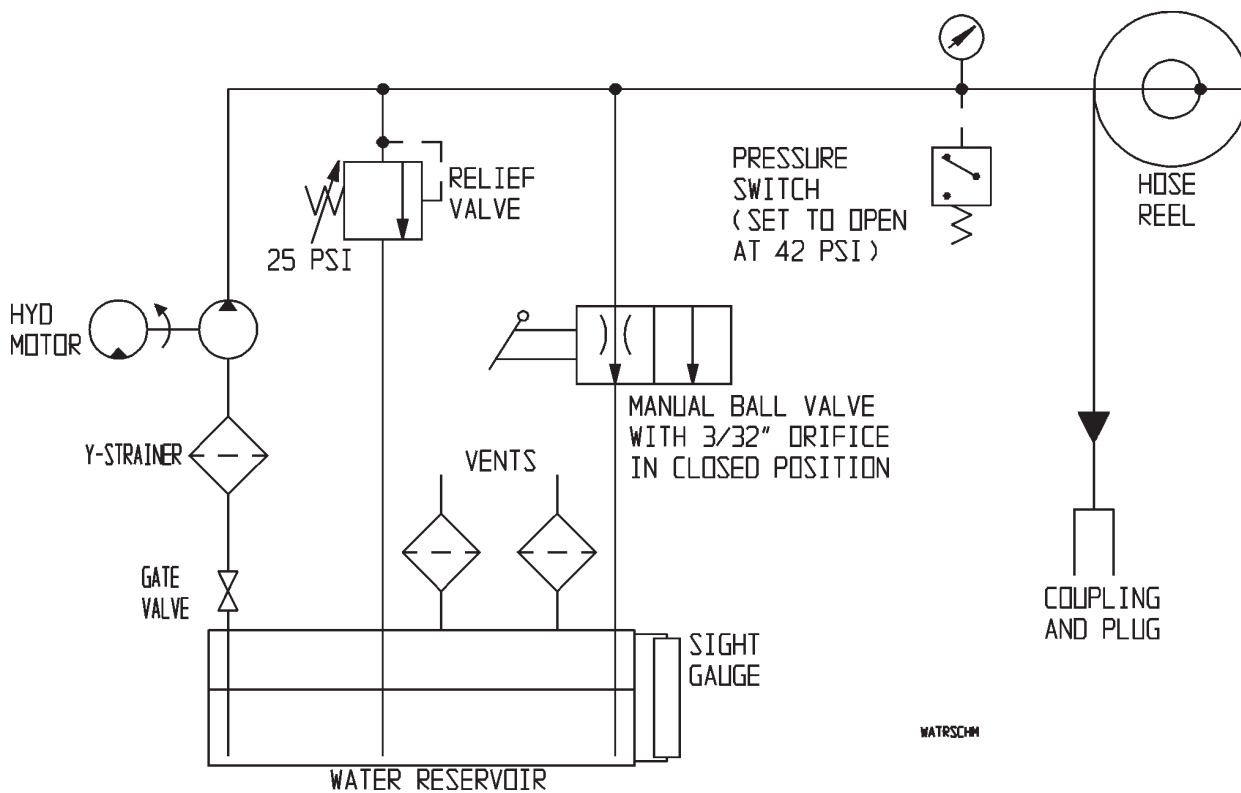
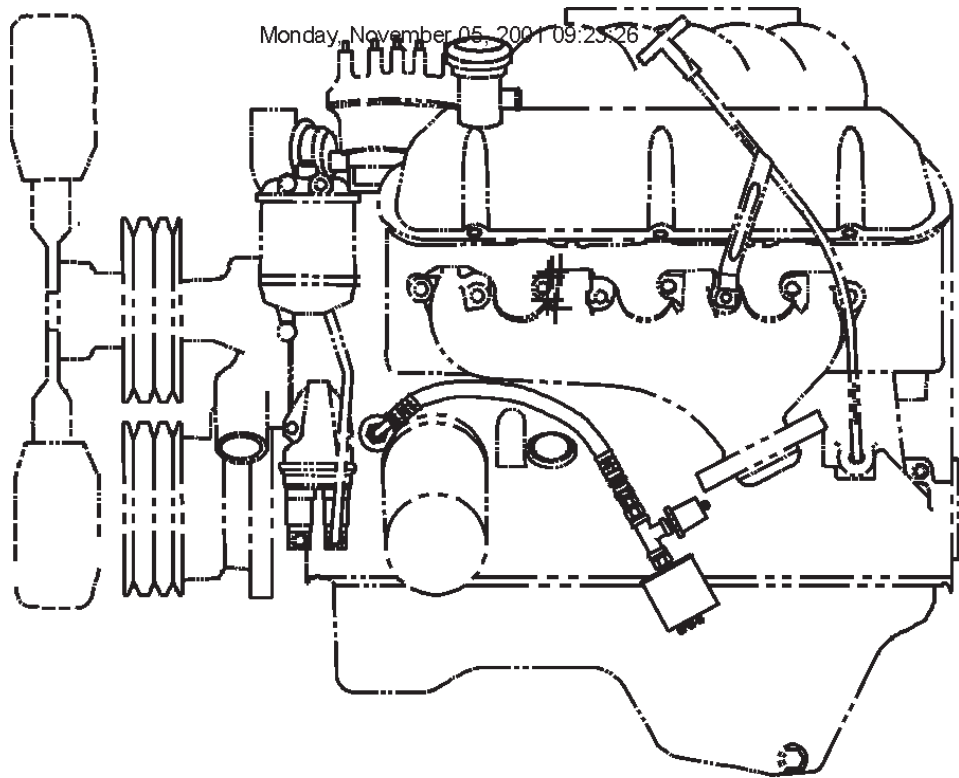


FIGURE 24. STANDARD WATER CIRCUIT



1996 THRU 1997
FORD ENGINE

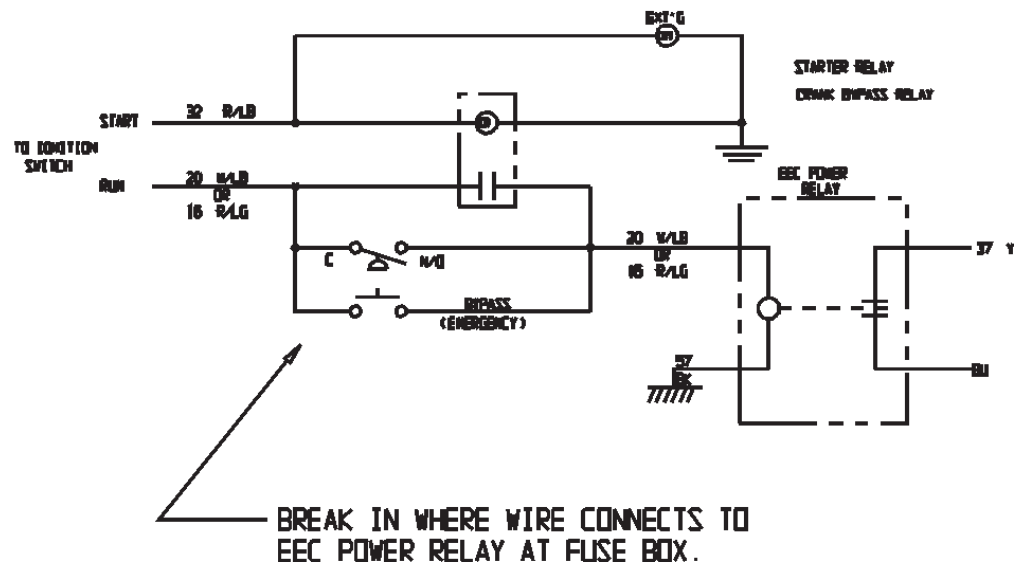
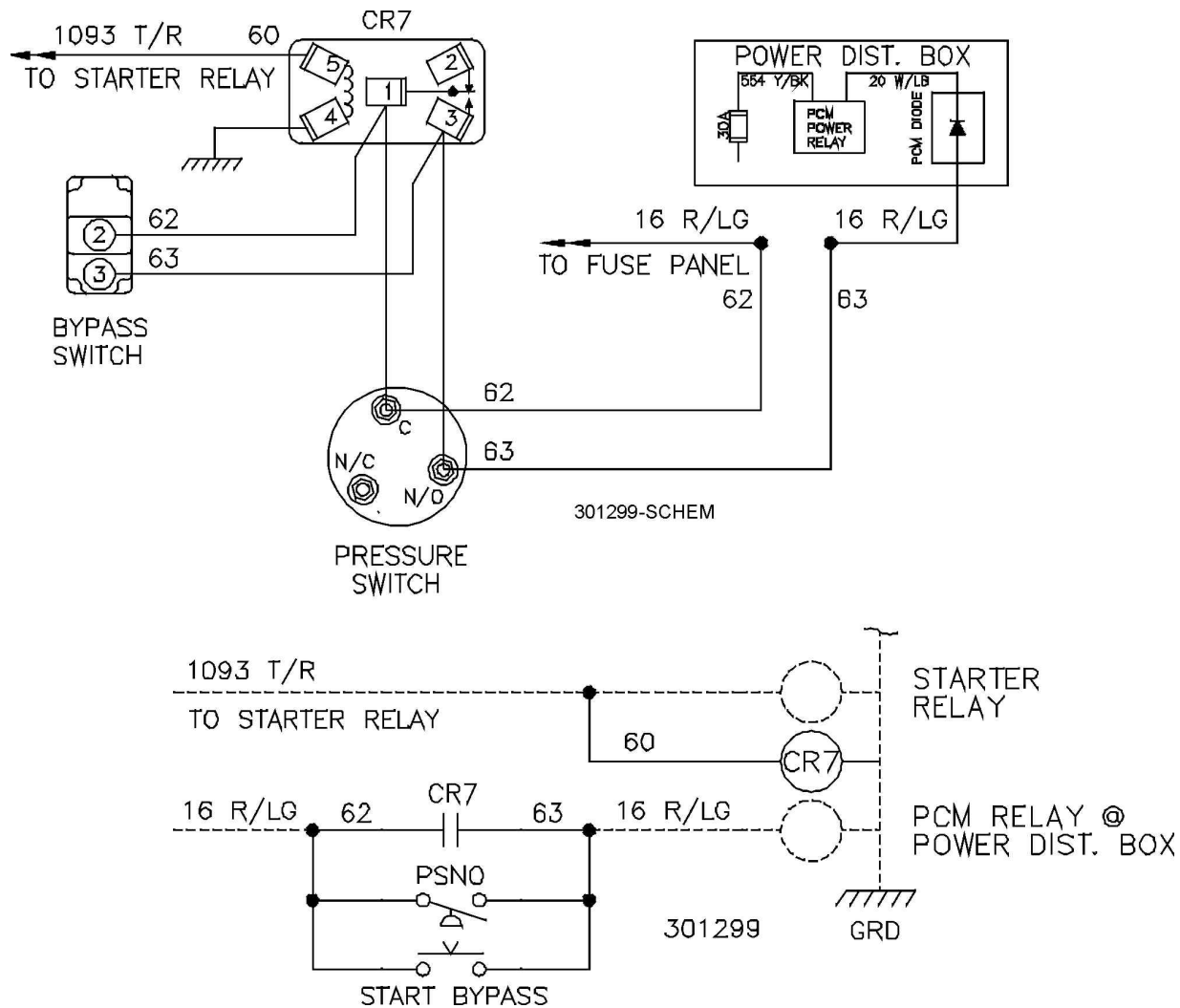


FIGURE 25. LOW OIL PRESSURE SHUTDOWN OPTION, GAS 96/97



FOR 2005 SEE FIGURE 42

FIGURE 26. LOW OIL SHUTDOWN OPTION, DIESEL, F350/F450, 99-2004

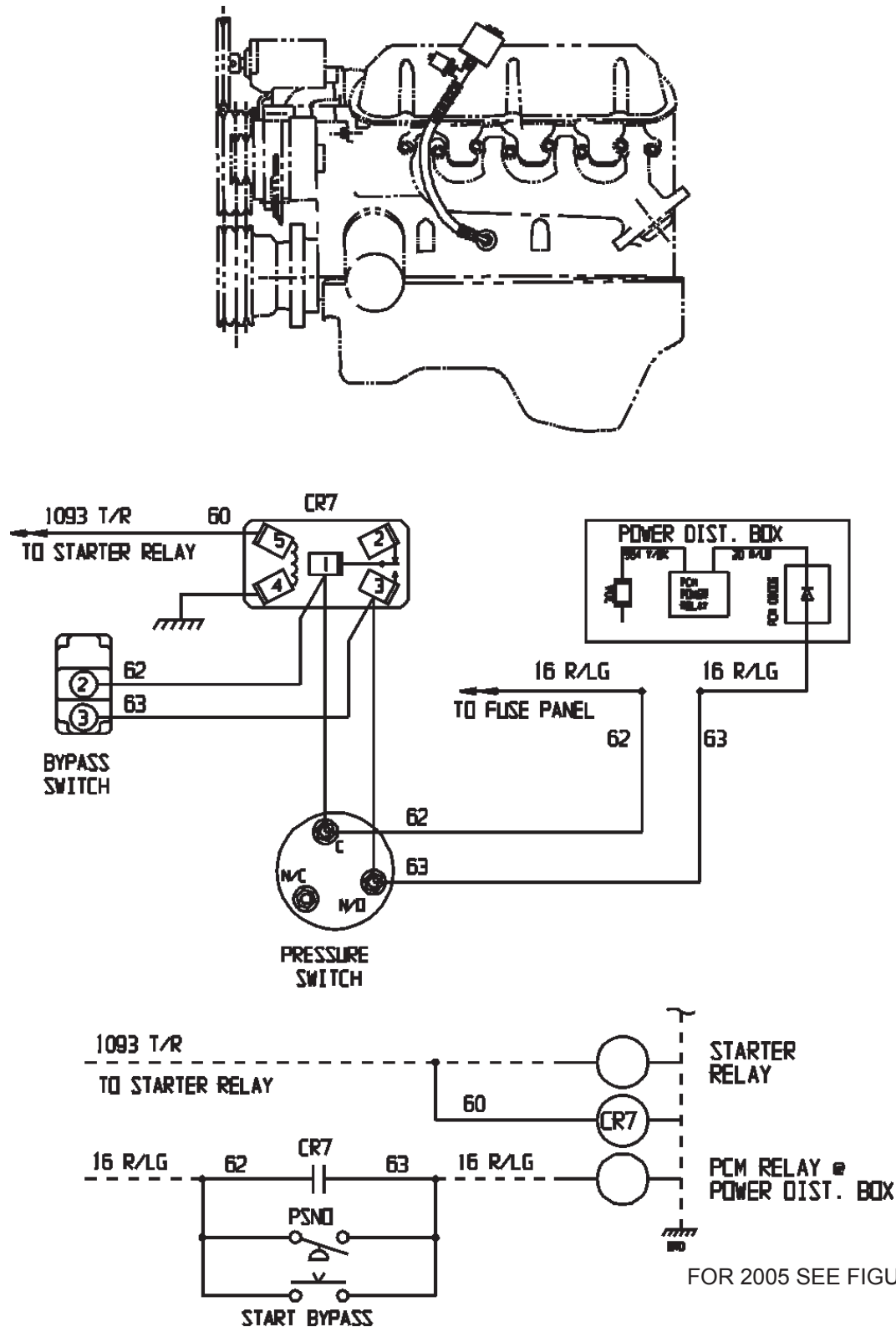


FIGURE 27. LOW OIL PRESSURE SHUTDOWN OPTION, GAS 99 & LATER

USE RING TERMINAL, ATTACH
TO MOUNTING SCREW FOR
302557 ADAPTER PLATE

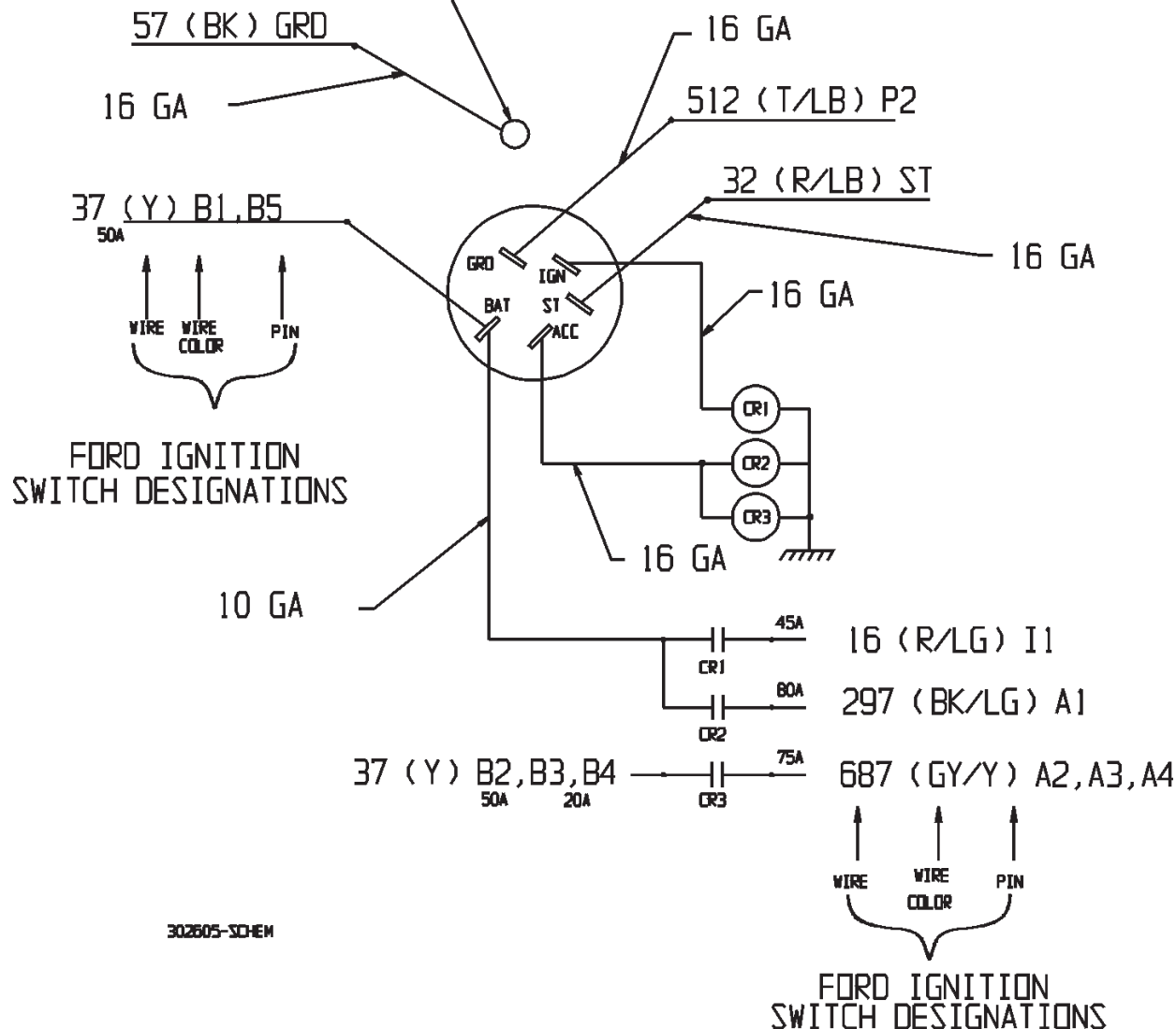


FIGURE 28. SWITCH, IGNITION, OPTION, COLE HERSEE, 1997 & EARLIER

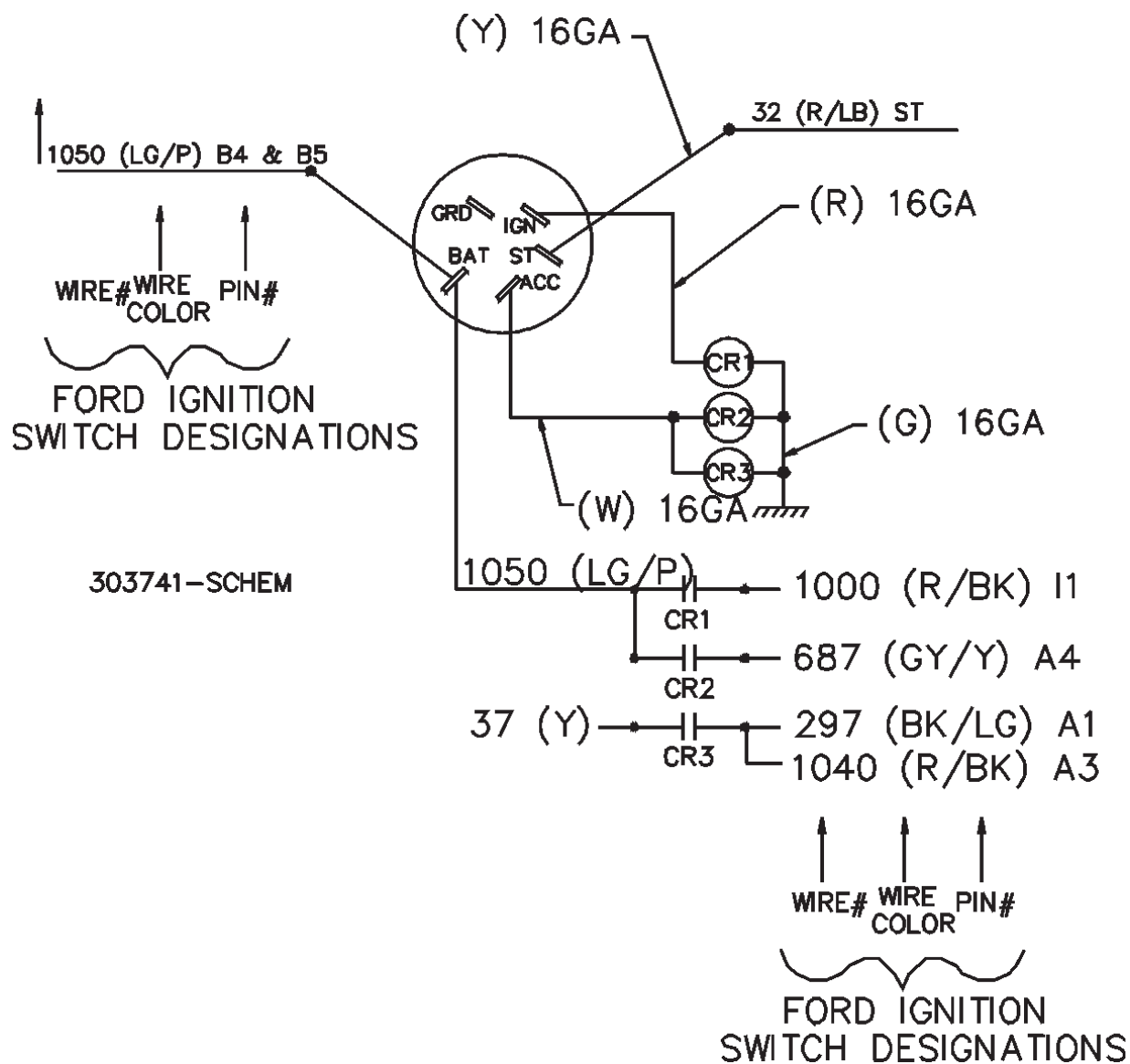
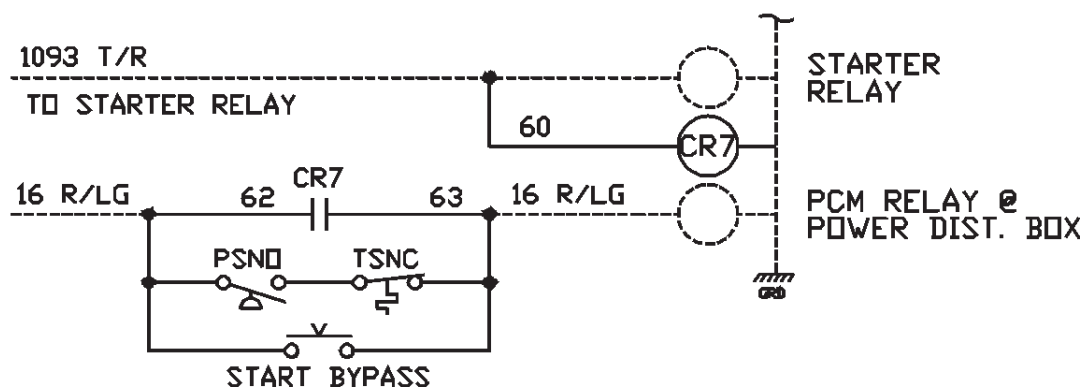
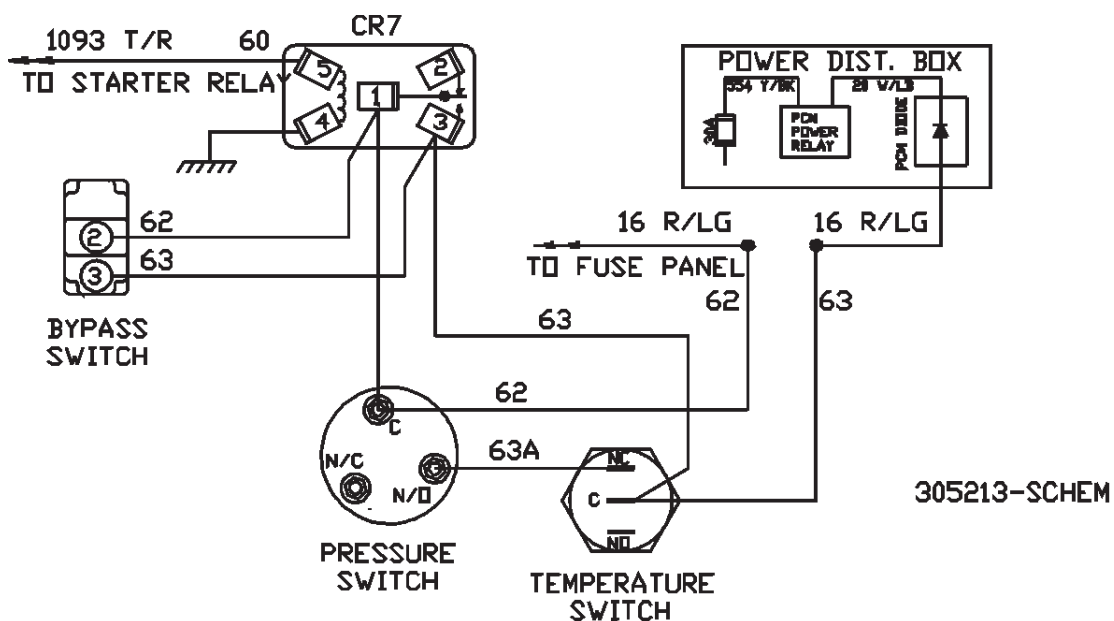


FIGURE 29. SWITCH, IGNITION, OPTION, COLE HERSEE, 99 & LATER



**FIGURE 30. HIGH WATER TEMP SHUTDOWN W/ LOW OIL SHUTDOWN OPTION,
DIESEL, F350/F450, 99 & LATER**

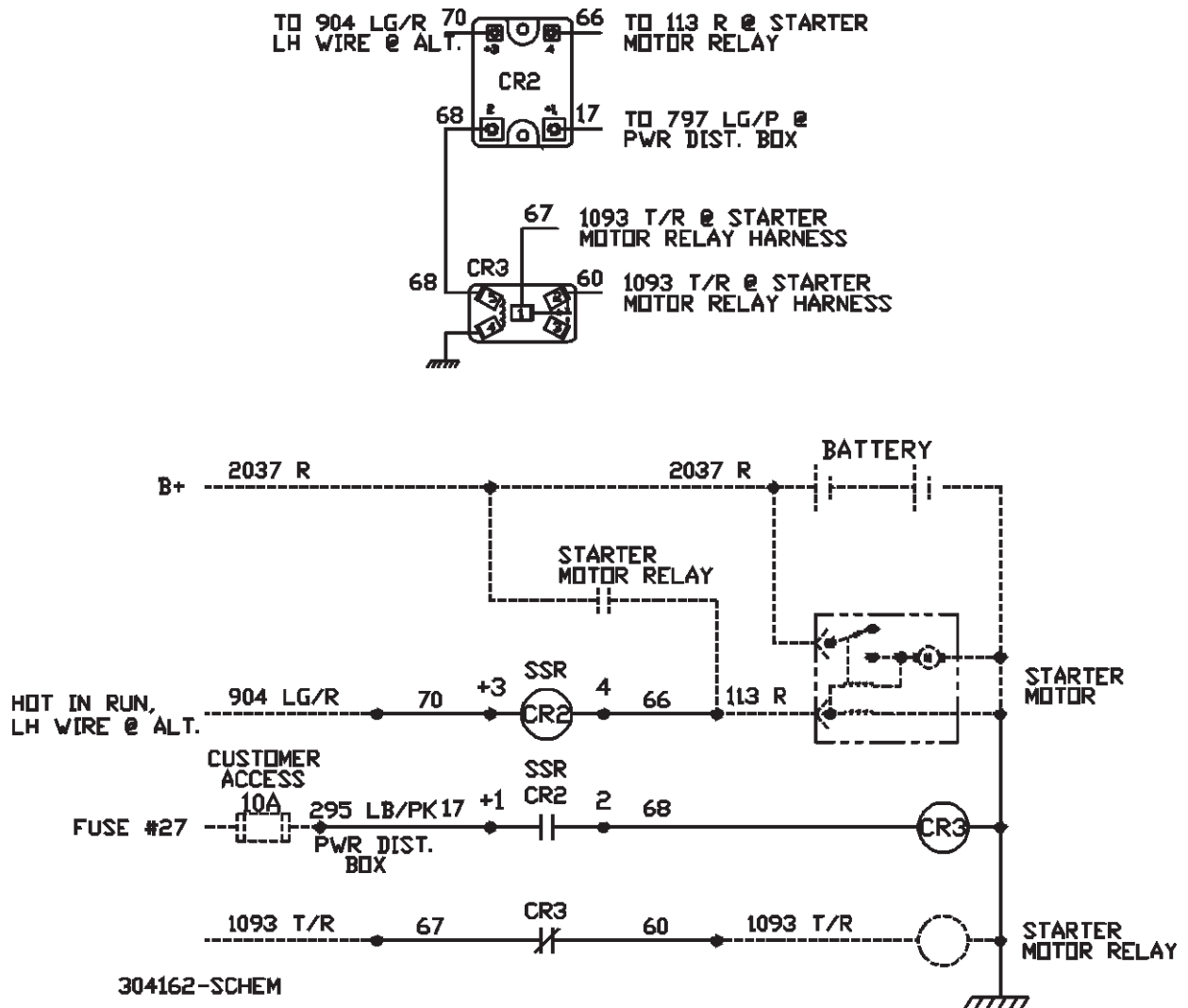


FIGURE 31. STARTER PROTECTION, F350/F450, DIESEL, 99 & LATER

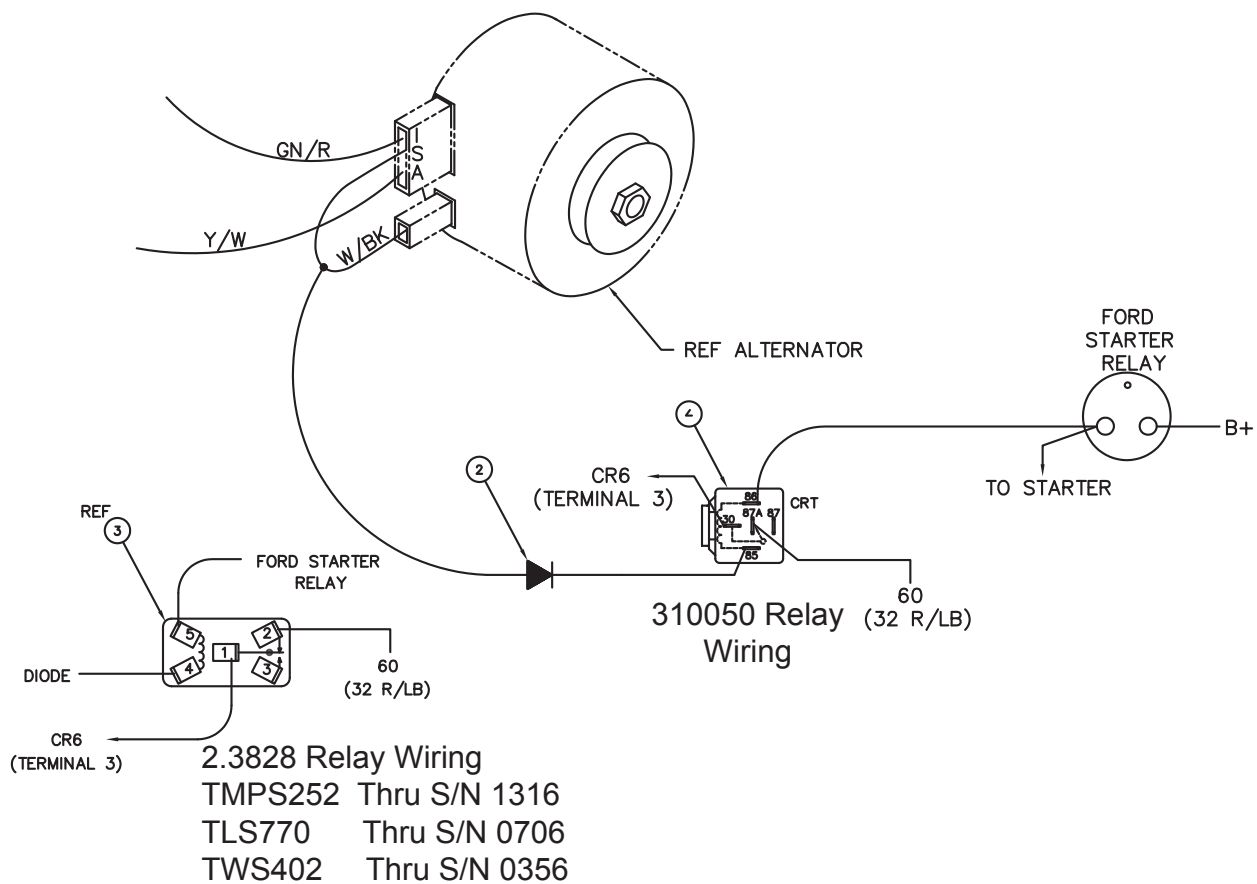
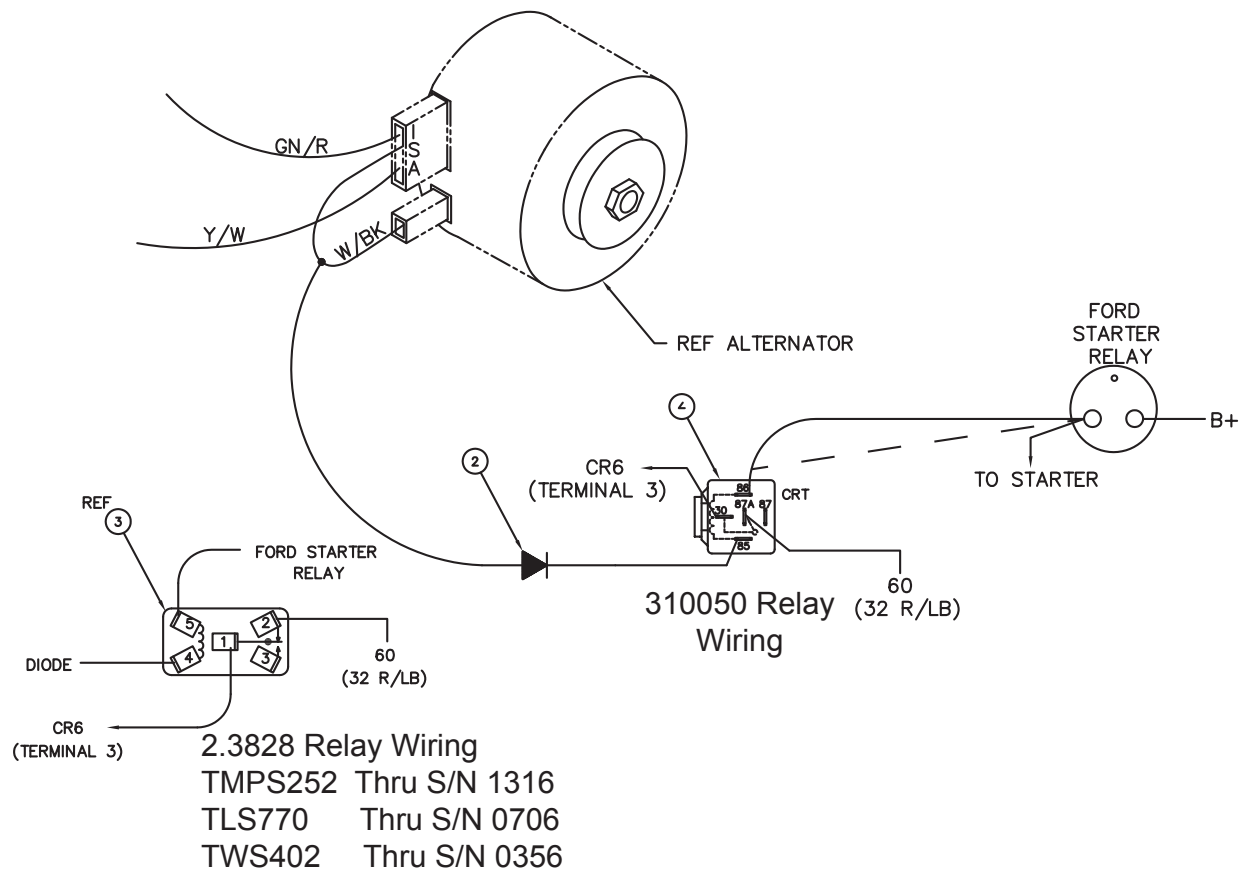


FIGURE 32. STARTER PROTECTION OPTION, GAS & DIESEL, 96/97


FIGURE 33. STARTER PROTECTION OPTION, GAS, 99 & LATER

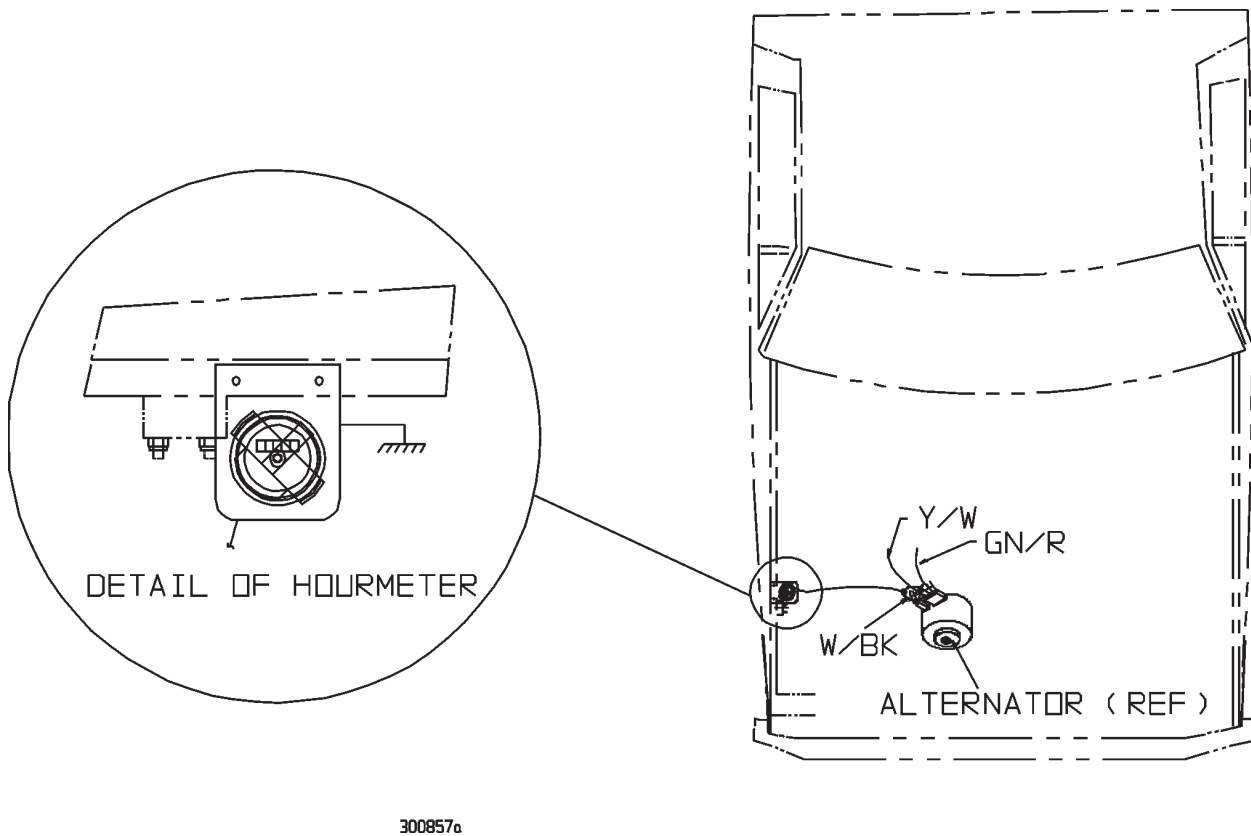


FIGURE 34. HOUR METER INSTALLATION OPTION, GAS & DIESEL, 96/97

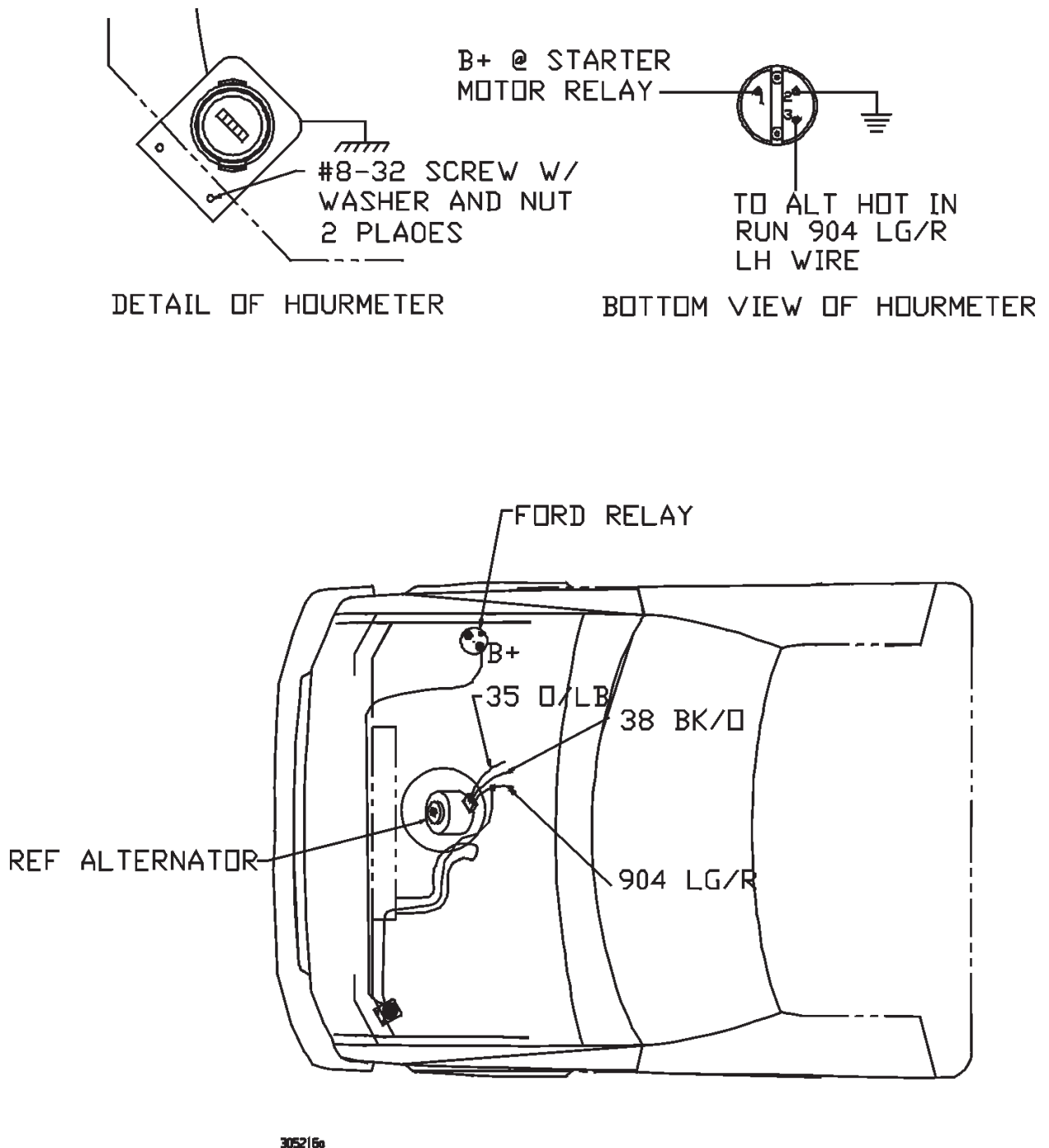
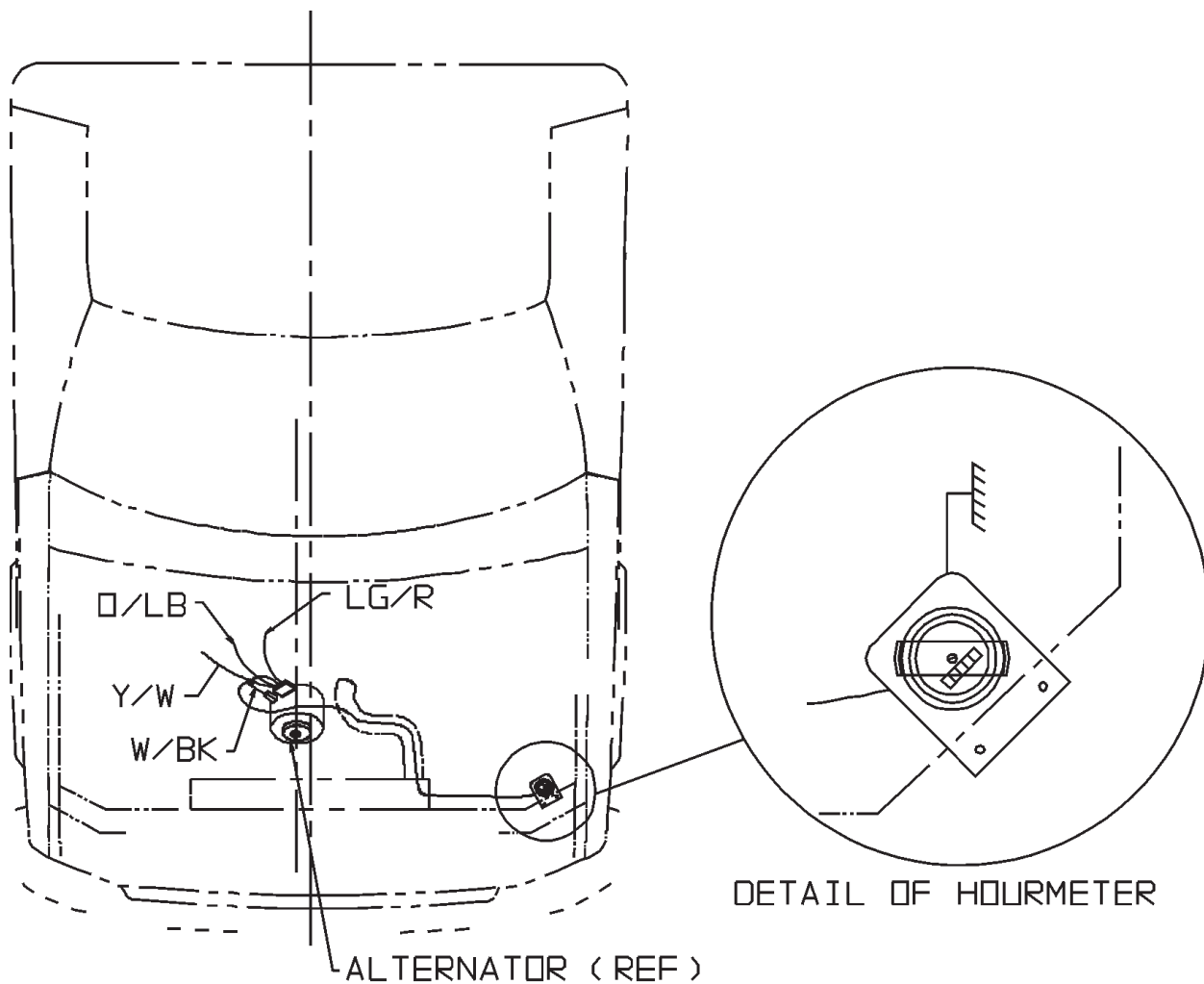
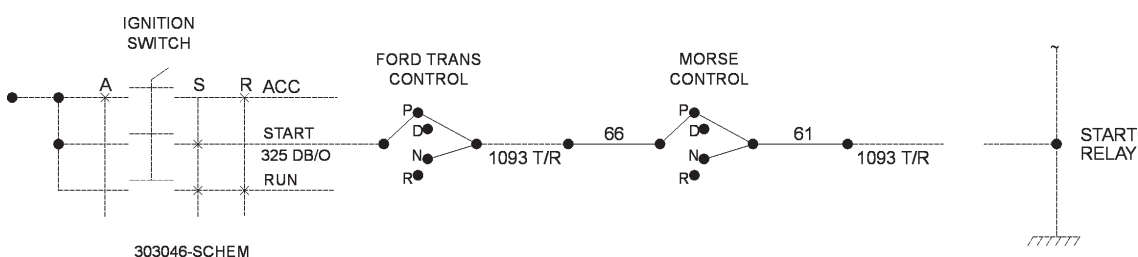


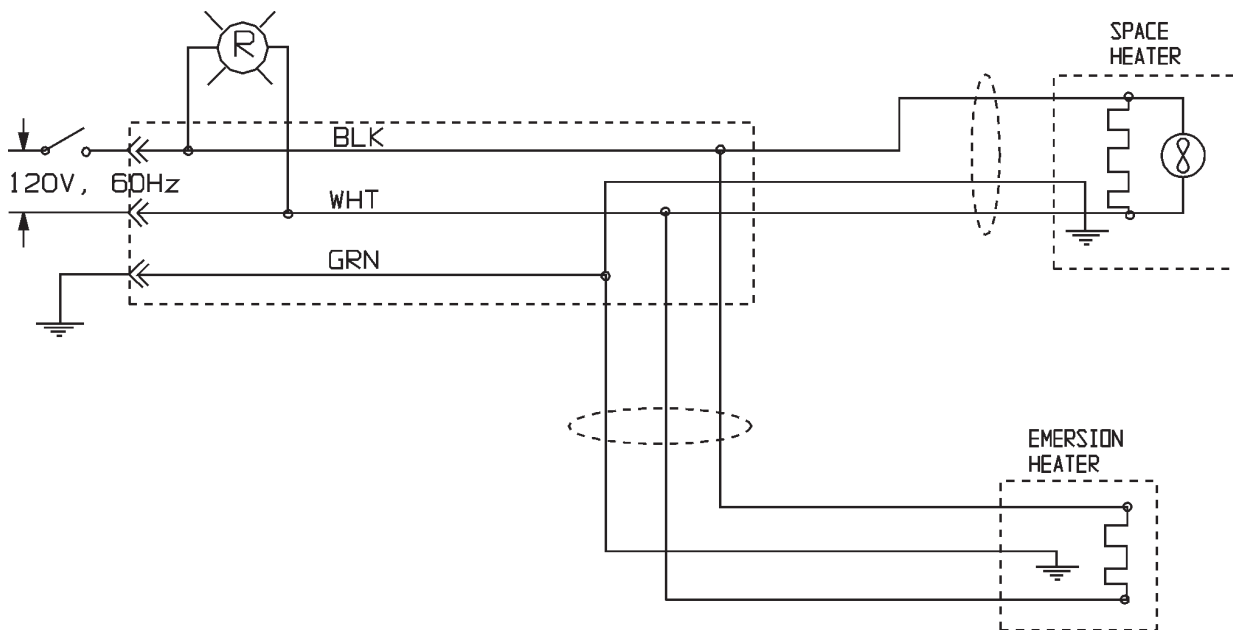
FIGURE 35. HOUR METER INSTALLATION, DIESEL, 99 & LATER



300857b

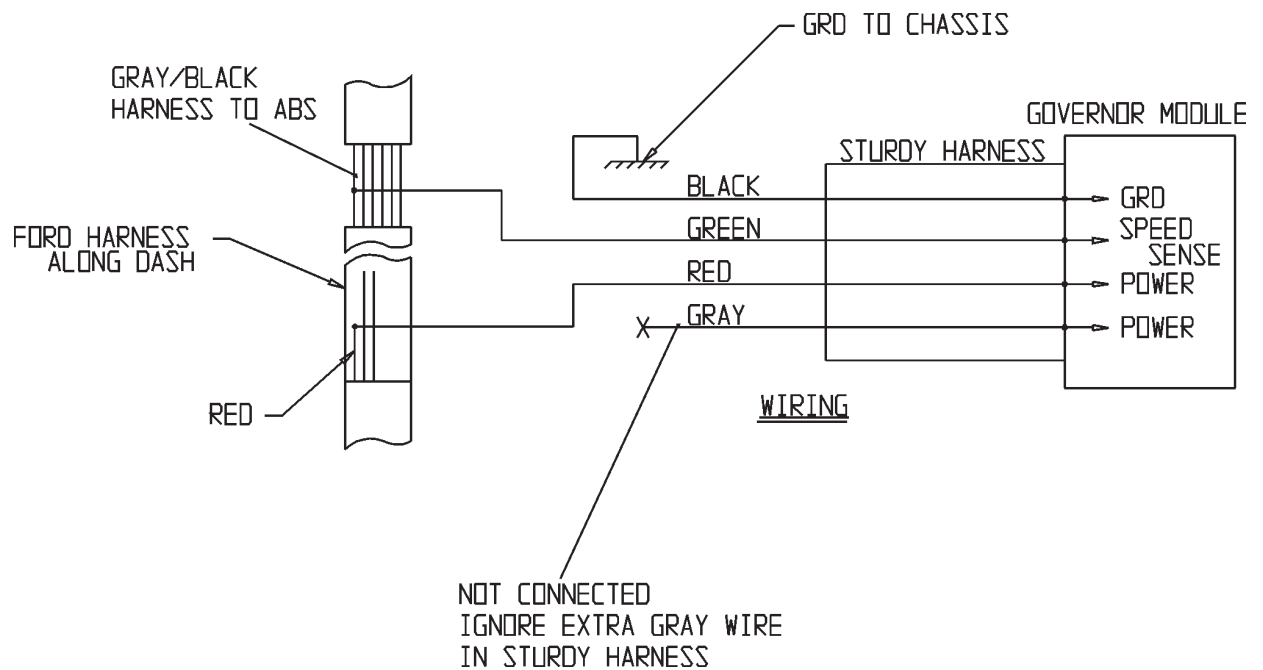
FIGURE 36. HOUR METER OPTION, GAS, 99 & LATER


FIGURE 37. NEUTRAL INTERLOCK, 2ND F350/F450 GAS/DIESEL, 99 & LATER



12207a

FIGURE 38. HEAT OPTION, 120 V



**FIGURE 39. ELECTRIC SCHEMATIC, DIESEL, GOVERNOR, 99 & LATER, OPTION
ELECTRIC SCHEMATIC, 350/V8, GOVERNOR, 02 & LATER**

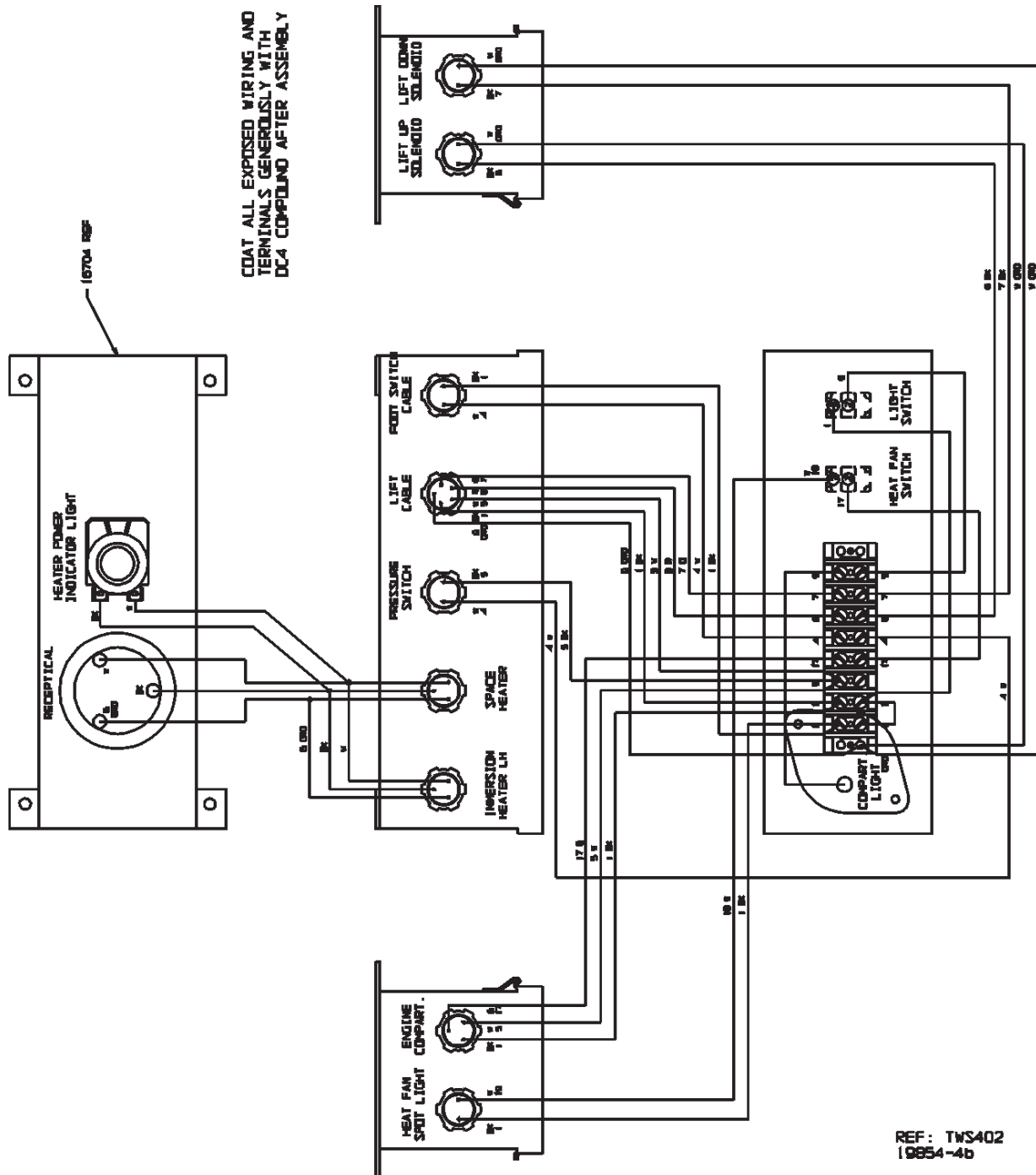


FIGURE 40. WIRING INSTALLATION, GROUND CONTROL ENCLOSURE

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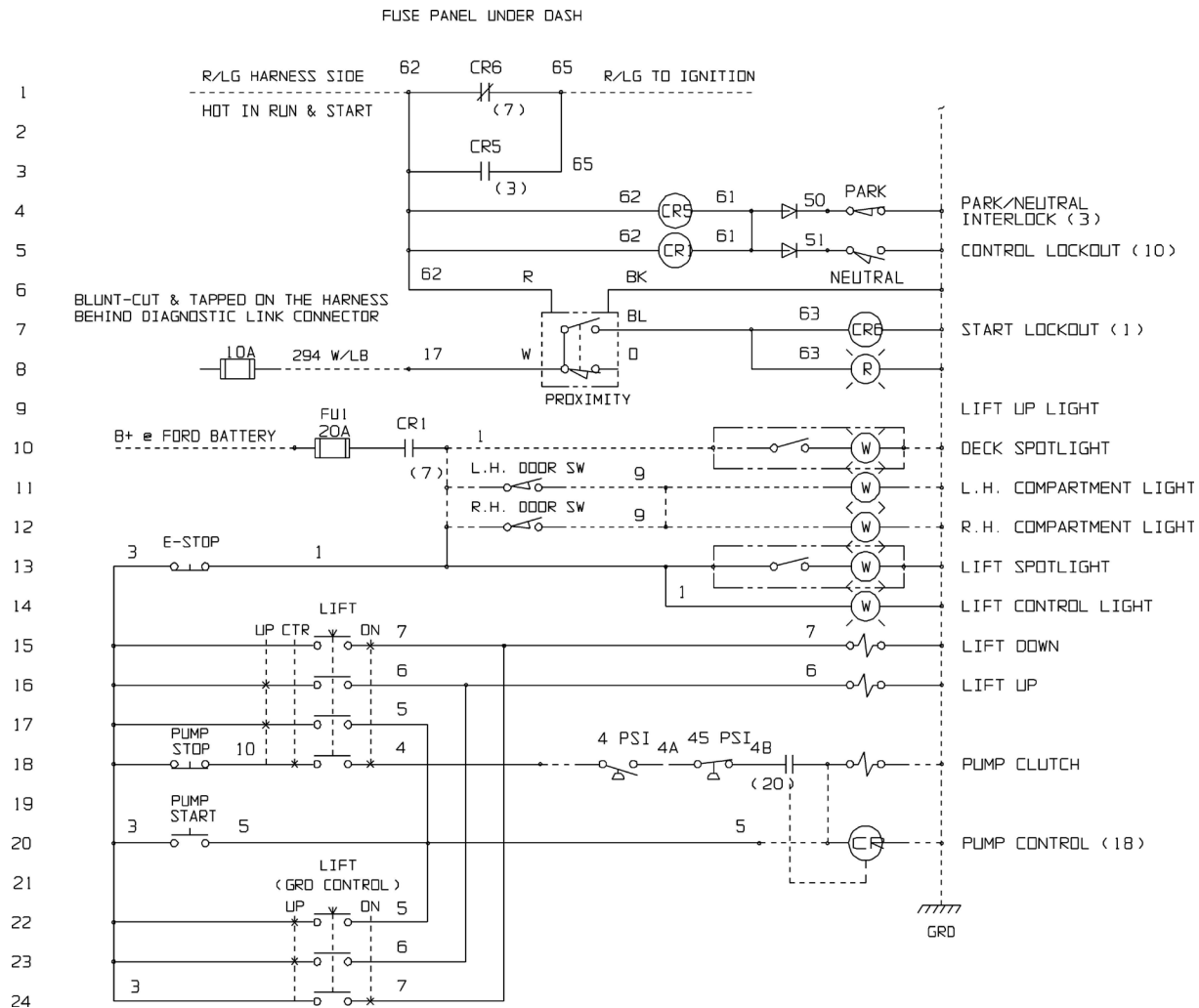


FIGURE 41. ELECTRIC INSTALLATION, REAR LIFT OPTION, GAS/DSL SCHEMATIC (2005 & 2010) EFF SN 363-377

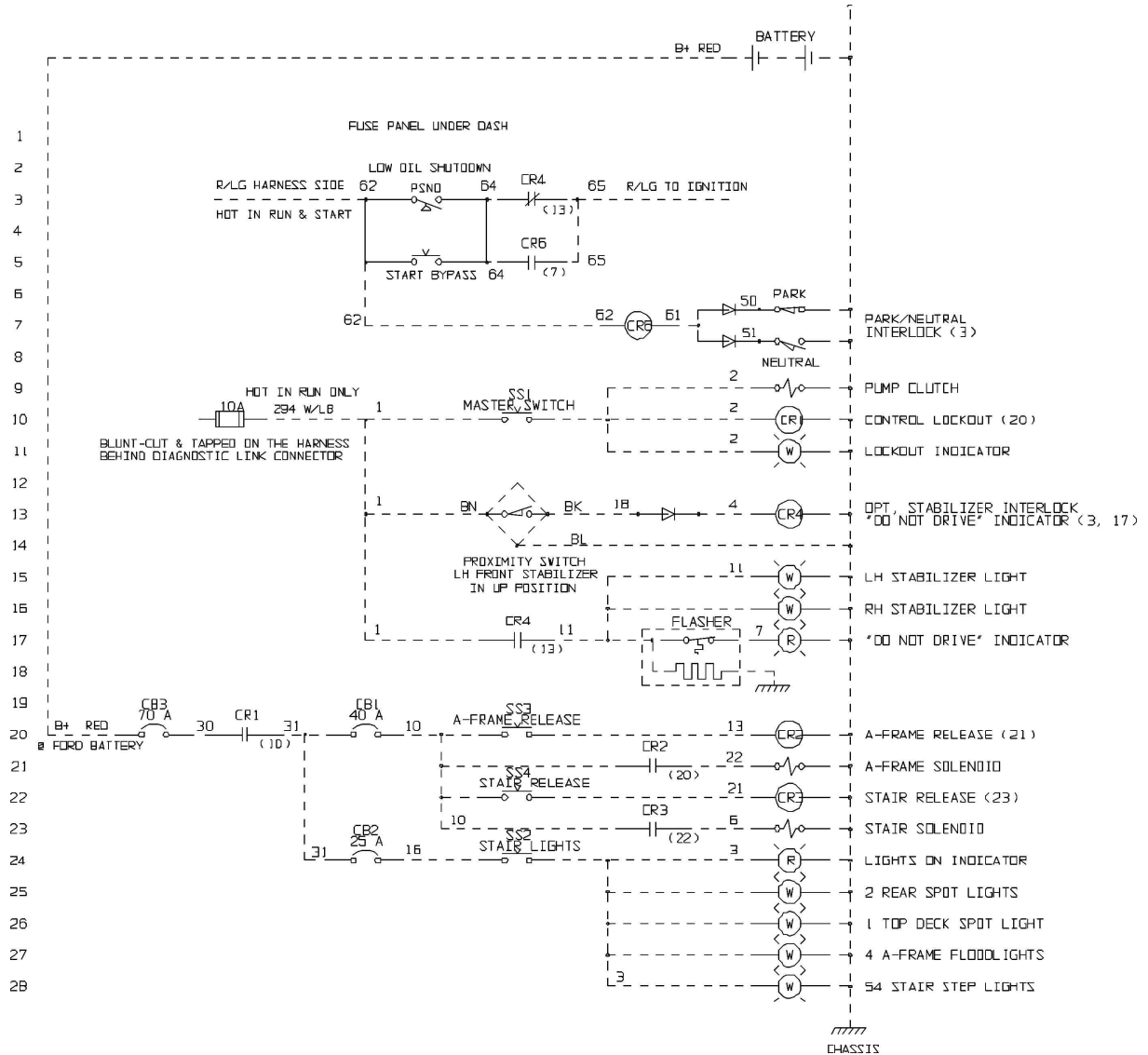


FIGURE 42. LOW OIL SHUTDOWN, GAS/DSL, ELECTRICAL SCHEMATIC, 2005 & LATER

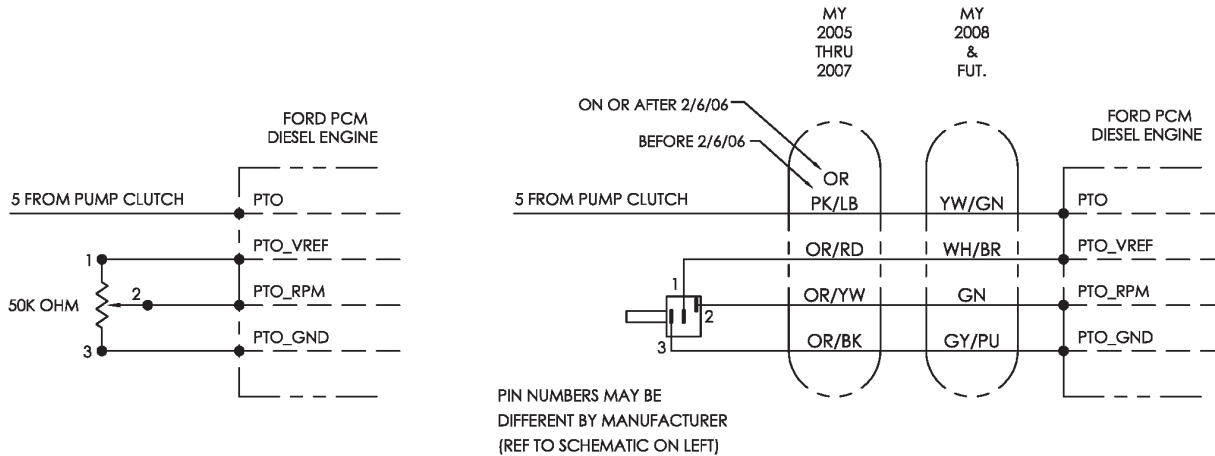
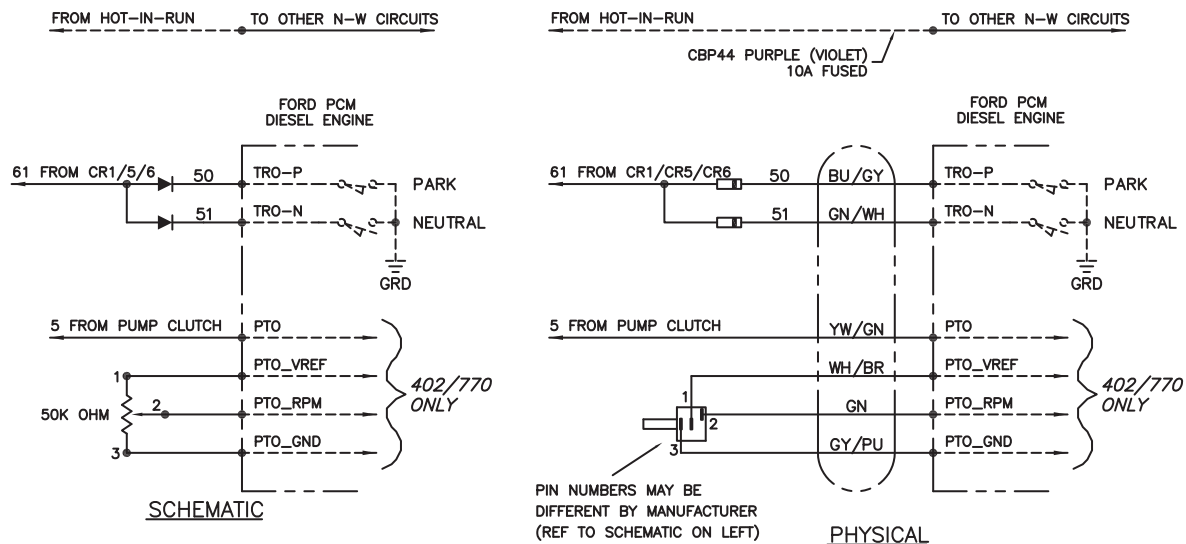


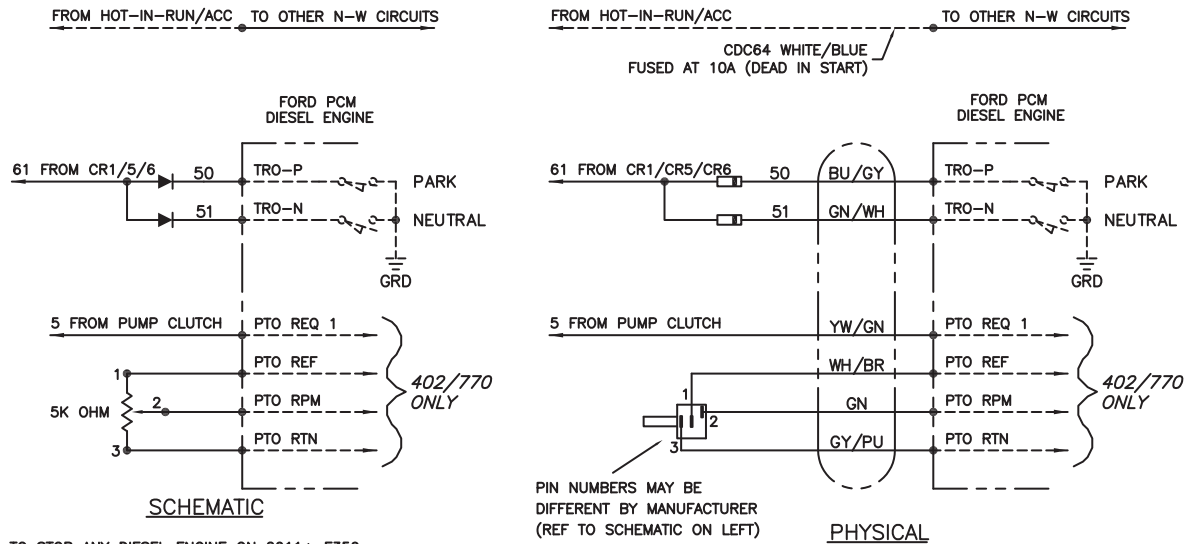
FIGURE 43. THROTTLE ADVANCE, F350, DIESEL, 2005 -2008



TO STOP ANY ENGINE ON 2009+ F350:

CUT HOT-IN-RUN WIRE CDC34 (WH-OR) BETWEEN SPLICE S233 AND PIN 1 OF IGNITION SWITCH CONNECTOR C250.
HOT SIDE IS PIN 1

FIGURE 44. THROTTLE ADVANCE, F350, DIESEL, 2009 -2010



TO STOP ANY DIESEL ENGINE ON 2011+ F350:

CUT HOT-AT-ALL-TIMES WIRE SBP28 (GN-RD OR BU/RD)
NEAR TO PIN 4 OF IGNITION SWITCH CONNECTOR C250.

HARNESS END IS HOT SIDE, PIN 4 IS LOAD SIDE

PASS-THRU WIRE COLORS:

CAC09 - BROWN/WHITE

CAC10 - WHITE

CAC11 - WHITE/ORANGE

CAC12 - GRAY/ORANGE

FIGURE 45. THROTTLE ADVANCE, F350, DIESEL, 2011

SCHEMATIC

TO STOP ANY ENGINE ON 2005-2007 F250-550:
CUT CIRCUIT 16 (RED WITH LIGHT GREEN STRIPE) AT THE FUSE PANEL UNDER-DASH. PIN 4 OF THE "C" CONNECTOR
TO STOP ANY ENGINE ON 2008 F350:
CUT HOT-IN-RUN WIRE CDC34 (WH-OR) BETWEEN SPLICE S233 AND PIN 1 OF IGNITION SWITCH CONNECTOR C250.
HOT SIDE IS PIN 1

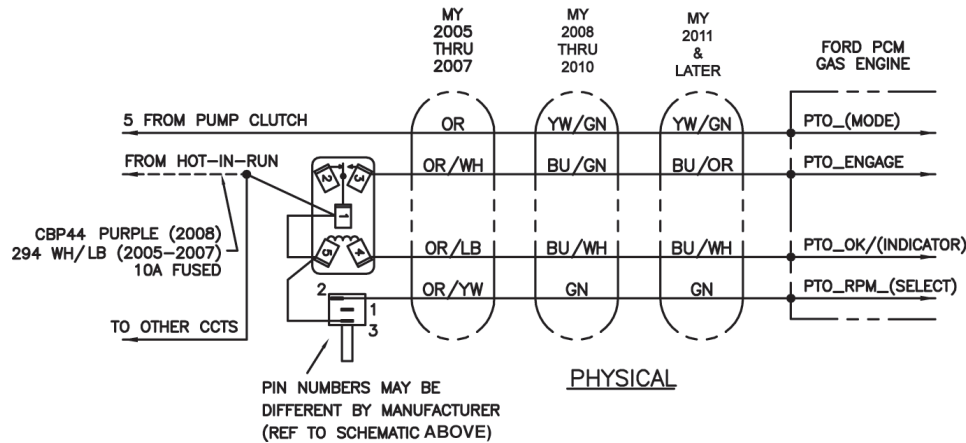
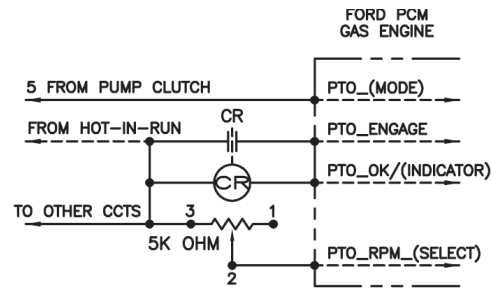
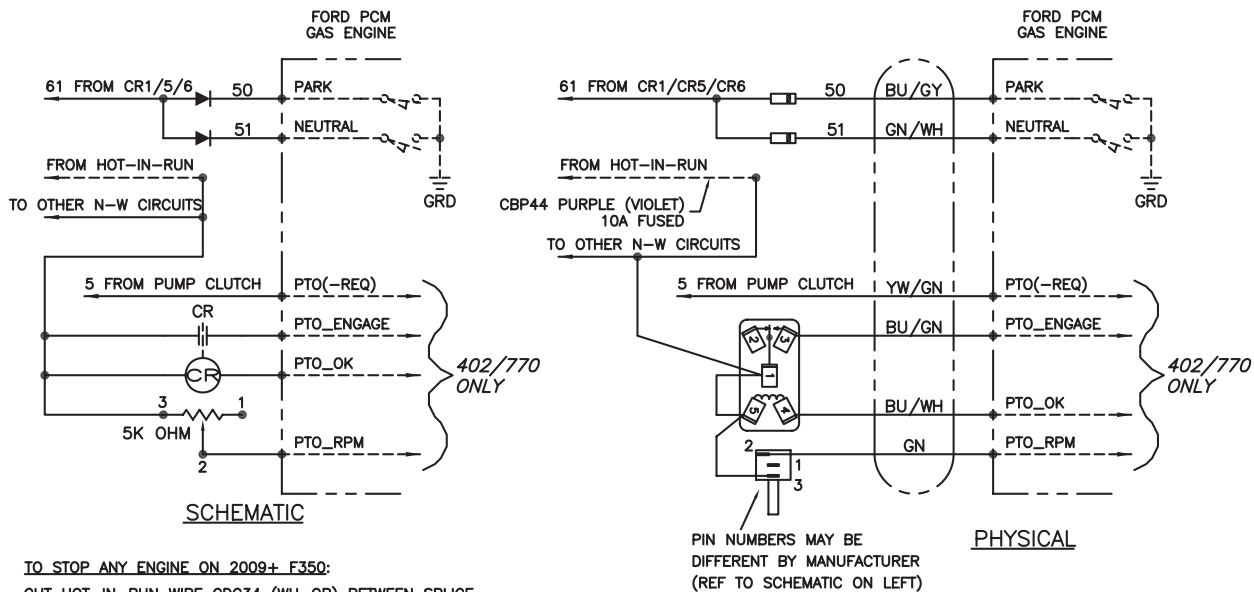


FIGURE 46. THROTTLE ADVANCE, F350, GAS, 2005 & LATER



TO STOP ANY ENGINE ON 2009+ F350:
CUT HOT-IN-RUN WIRE CDC34 (WH-OR) BETWEEN SPLICE S233 AND PIN 1 OF IGNITION SWITCH CONNECTOR C250.
HOT SIDE IS PIN 1

FIGURE 47. TRUCK WIRING INTERFACE, F350, GAS, 2009-2010

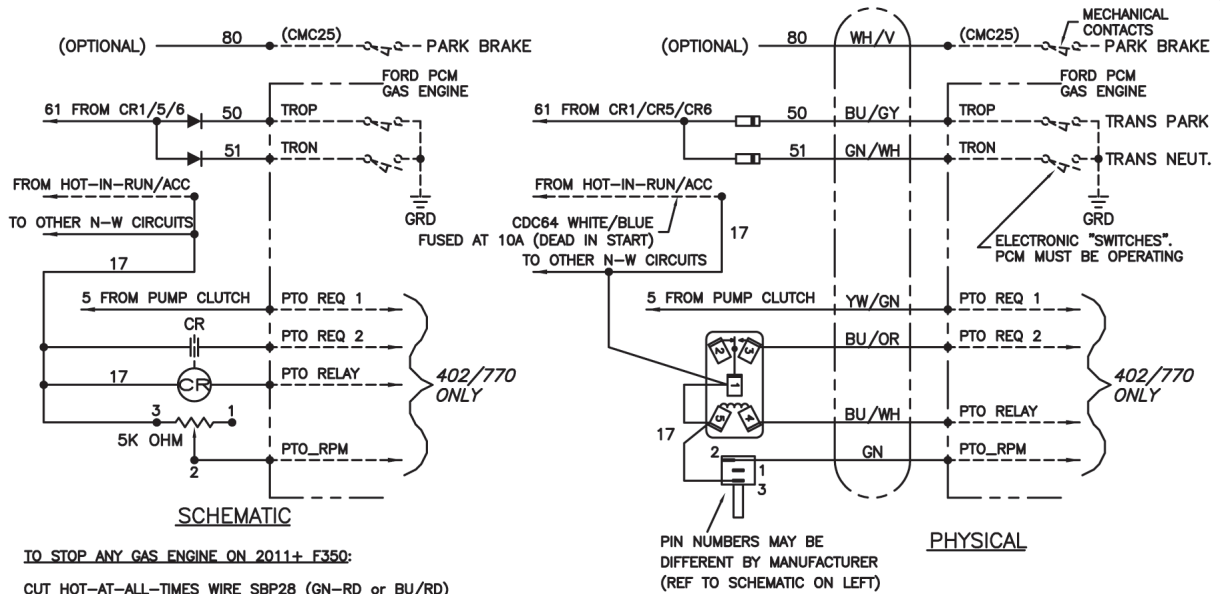


FIGURE 48. TRUCK WIRING INTERFACE, F350, GAS, 2011-2012

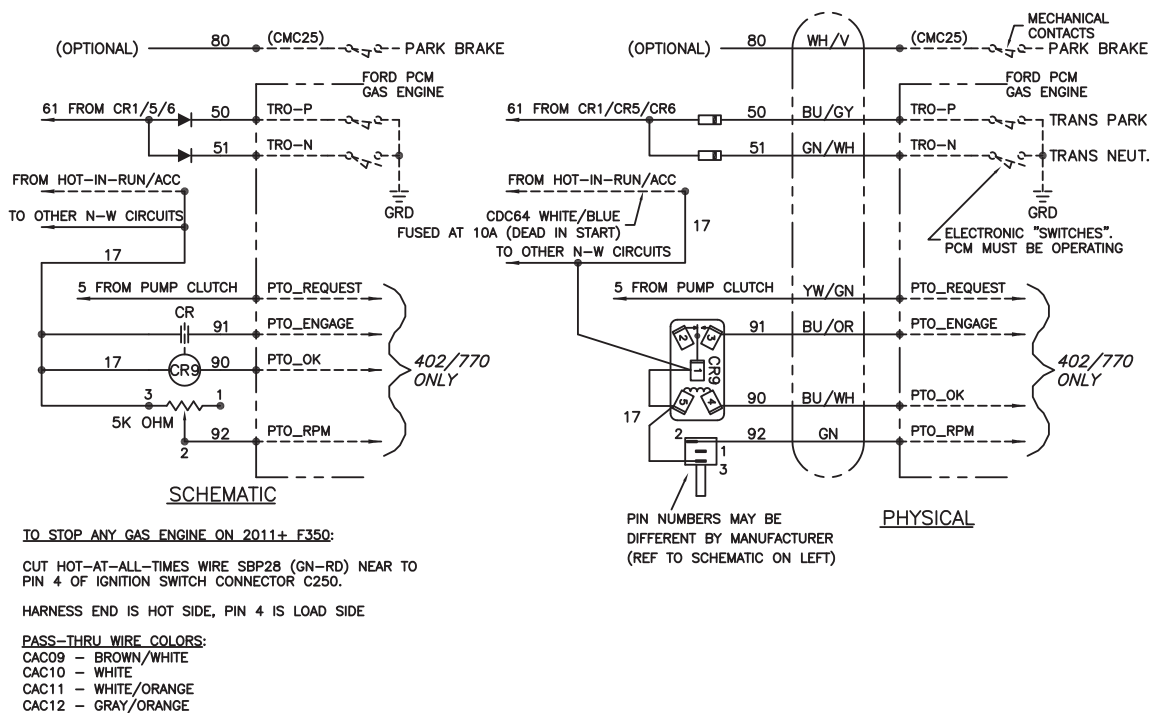


FIGURE 49. TRUCK WIRING INTERFACE, F350, GAS, 2013-2014

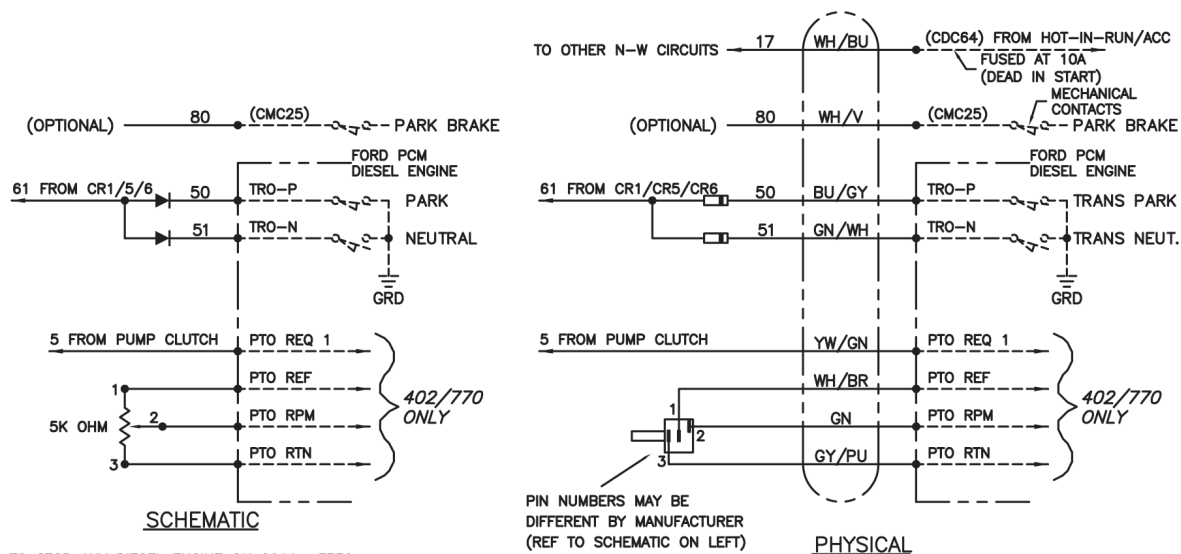


FIGURE 50. TRUCK WIRING INTERFACE, F350, DIESEL, 2011

3 REMOVAL AND INSTALLATION

⚠ WARNING Perform lockout/tagout procedures before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could cause serious injury or death.

⚠ CAUTION Using non-original replacement parts is not recommended. Their use may cause unit failure and/or affect vehicle safety.

3.1 GENERAL

Little or no instruction is needed for removal and installation of components. The work should be quite easy for any qualified automotive mechanic. No special tools are required for any of the work. All work can be accomplished in readily accessible areas.

Repairs should be restricted to the procedures mentioned in this Chapter and to replacement of parts and assemblies that are defective. Refer to Chapter 4 for proper parts identification and location, and also refer to the manufacturer's information in Chapter 5. The tank assembly is composed of welded AISI 304 stainless-steel sub-assemblies and should not require removal, disassembly, or repair throughout its service life. If repairs are required, contact the Engineering Department of NMC-Wollard, Inc.

Refer to the chassis manufacturer's shop manuals for data concerning removal and installation of the components in the truck chassis, drive train, and engine. Dual rear wheel vehicles are equipped with wheels that are attached to the wheel hubs with integral two-piece swiveling lug nuts. Lug nut torque must be 140 ft-lbs. ± 15 ft-lbs.

⚠ WARNING To minimize the risk of tire/wheel failure and loss of vehicle control, when servicing tire/wheels:

- Do not use cleaning solvent on tires. Solvents cause deterioration of the rubber.
- Never inflate tires with air from systems using alcohol evaporators.
- Never mix rim parts of different manufacturers or different sizes.
- Do not use damaged parts.

⚠ CAUTION Before repairing the electrical system, disconnect the positive cable from the battery to prevent possible injury due to electrical shock.

⚠ CAUTION

After initially mounting wheel and tire assembly, recheck lug nut torque after the first hour of operation and after the first 8 hours of operation. After this, check monthly or every 250 hours, whichever comes first. Do not lube wheel studs as it will result in inaccurate tightening torque. Failure to follow these procedures could result in wheel mounting failure and loss of vehicle control.

3.2 STRUCTURAL COMPONENTS

Structural repair is at the discretion of the user's maintenance shop and should follow the standard shop practices of that shop. The user should determine if the component is beyond economical repair and should be replaced.

- Repair cracks or metal fatigue failures by stop-drilling, welding, patching or splicing.
- Prime paint marred, rusted or damaged finish using a high grade primer and finish paint materials.
- Areas which have become extremely oily or greasy should be cleaned with mineral solvents and degreasing agents before painting.

NOTICE! Perform no welding, cutting, patching, etc., on any load-bearing or supporting structure. If such repairs are required, contact the engineering department of NMC-Wollard, Inc. for instructions prior to commencing the work.

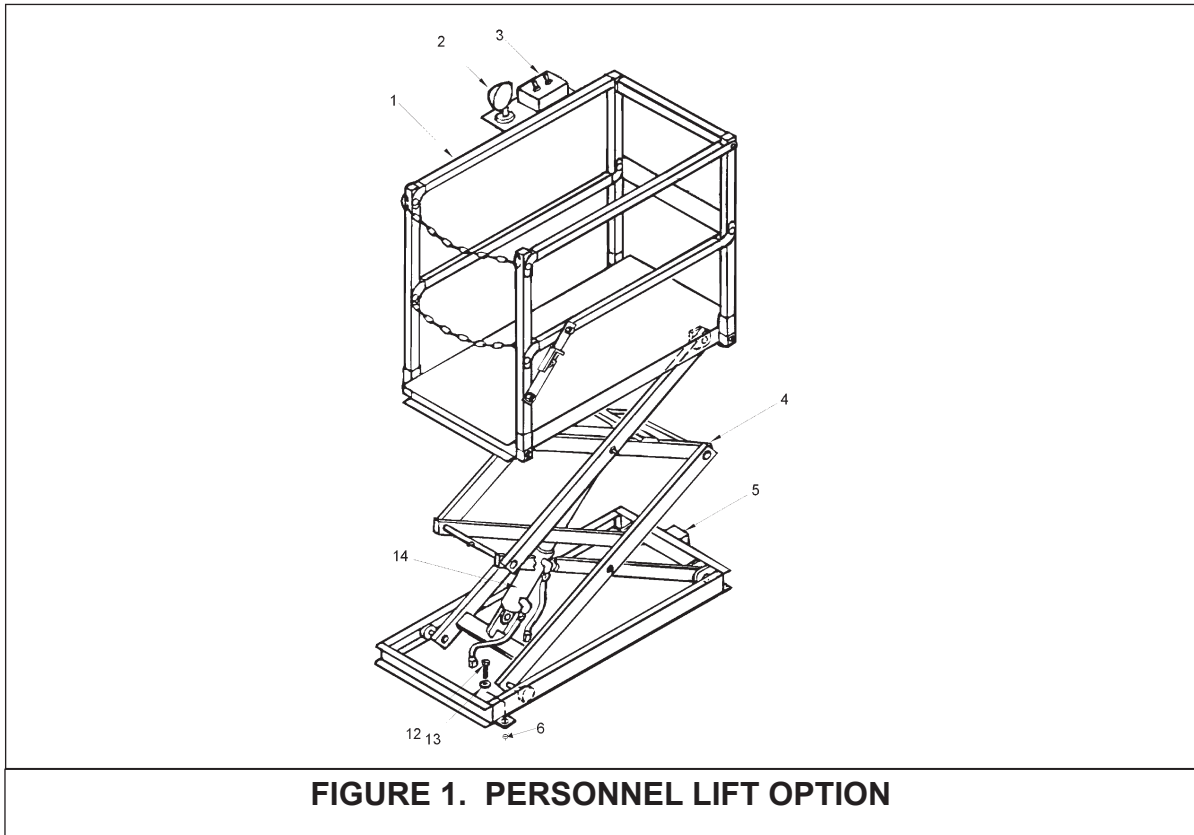
3.3 ELECTRICAL COMPONENTS REMOVAL AND INSTALLATION

Electrical system components are conventional items requiring conventional methods of mounting. An automotive mechanic possessing normal skills can accomplish removal and installation of any electrical part. Use the schematic diagram in Chapter 2 and the exploded views and parts listings in Chapter 4 as a guide.

3.4 HYDRAULIC COMPONENTS REMOVAL AND INSTALLATION

Plumbing within the hydraulic system uses standard hydraulic lines, fittings, and hoses. Relief and check valve installations follow normal hydraulic system layout and mounting methods, assuring uncomplicated maintenance procedures. Major assemblies require more attention to installation methods. During removal of major components, observe mounting and installation, such as type and number of shims used, type of mounting hardware, and note order of disassembly. Also note any other peculiarities which will assist during installation. After replacing any component in the hydraulic system, run a complete operational check

NOTICE! Keep dirt out of the hydraulic system. Immediately place properly fitted caps over any exposed hydraulic ports or hose ends. When installing caps, make sure you don't push dirt into the opening.



3.5 PERSONNEL LIFT

See figure 1

3.5.1 Removal and Installation

All work can be done with standard hand tools and a suitable hoist to raise lift clear and away from the water service truck.

Removal

1. Start truck engine.
2. Raise lift to a sufficient height to have access to hydraulic hose fittings on hydraulic lift cylinder (14).
3. Install maintenance prop or block under lift platform securely.
4. Stop truck engine.
5. Disconnect electric wiring leading to the two control switch boxes at the junction box in the pump compartment. Disconnecting these conductors and retightening remaining conductors on terminal strip in box will not affect water truck operation. One control switch box is located on base of lift (5) and the other on handrails (3) (Tag wires for identification.)
6. Disconnect hydraulic hoses from lift cylinder (14) at the deck bulkhead fittings. Have a suitable container at hand to catch any spilled hydraulic oil. Tag hoses for identification.
7. Attach hoist to lift.
8. Remove the four-bolts (12) attaching lift base to water service truck. Save bolts (12) and lockwashers (13) for reinstallation.
9. Remove lift.

Installation

1. Position lift on water service truck with a suitable hoist and install attaching hardware (bolts and lockwashers).
2. Block up lift under platform at a height sufficient to have access to lift cylinder ports for attaching hoses.

NOTE: Make sure that drilled hole in elbow in cylinder port (end opposite piston) is clear if elbow has been removed.

3. Connect hydraulic hoses.
4. Connect electric wiring.
5. Remove hoist sling and shoring blocks.
6. Start truck engine.
7. Test lift for proper operation and hydraulic leaks. Make corrections if required.
8. Test water pump switches. Remember, there are two switches: one on base of lift and one on handrail. Test both switches.
9. If all checks out okay, lift is ready for servicing aircraft.

3.5.2 Hydraulic Cylinder

Removal

1. Start truck engine.
2. Raise lift to a sufficient height to have access to hydraulic hose attach fittings on hydraulic lift cylinder.
3. Block under lift platform securely.
4. Stop truck engine.
5. Disconnect hydraulic hoses from lift cylinder at the deck bulkhead fittings. Have a suitable container at hand to catch any spilled hydraulic oil. Tag hoses for identification.
6. Remove cylinder attach pins. Save for reinstallation.
7. Remove cylinder from lift structure.

Installation

1. Block up lift under platform at sufficient height to allow cylinder to be positioned in place.
2. Install attach pins.
3. Connect hydraulic hoses.
4. Test system by operating lift through several raise/lower cycles.

3.6 HYDRAULIC SYSTEM – SPECIAL INSTRUCTIONS

NOTICE! To minimize hydraulic system damage, do the following:

- Cleanliness is the best way to insure satisfactory component life, on either new or repaired units. Cleaning parts by using a solvent wash and air drying is adequate if clean solvent is used. This is precision equipment. The internal mechanism and related items must be kept free of foreign materials and chemicals.
- Protect all exposed sealing surfaces and open cavities from damage and foreign materials.
- Always replace gaskets and O-rings. Clean gasket sealing surfaces prior to installing new gasket. Lightly lubricate all O-rings with clean petroleum jelly prior to assembly.
- Keep oil storage areas clean and dry.
- Keep barrel bungs covered and sealed until you're ready to use the oil.
- Clean the bung seals before removing them, and clean the bung before removing it.
- Use only clean pumps and conduits to transfer fluid from barrels to the reservoir. Clean the system's entry port thoroughly.

- Filter all fluid introduced into the reservoir through a nominal, no-bypass, 10-micron filter. Do not use a bucket or such method.
 - Never add used fluid to the system. The high costs of downtime and component replacement is more costly than the price of new oil.
 - Never mix hydraulic fluids. It is highly possible that the additive package of one fluid will not be compatible with the other's additives. You can end up with a fluid in which none of the additive packages do their jobs.
 - In the event of a catastrophic failure of a pump or motor: Drain, clean, flush the system, and change filters. Otherwise, metal particles and dirt can remain in the system to cause damage after you replace the component.
1. To drain tank, place a container under the tank and remove drain plug. Drain and discard oil.
 2. Replace container under the open drain and flush tank interior with a mineral spirits type solvent. Allow time for the cleaning material to drain and tank interior to dry. A jet of air (low pressure) applied into the tank will speed the drying. Remember, keep the tank clean!
 3. Replace drain plug and fill tank with recommended oil to proper level on dipstick (MOBIL DTE-13).

Start engine and operate system. Recheck oil level. Add oil if required.

3.7 HYDRAULIC SYSTEM SAFETY

⚠ WARNING To minimize risk of serious injury or death, follow these hydraulic servicing precautions:

- Follow all necessary lockout/tagout procedures.
- Hydraulic systems have residual, stored pressure. Relieve all pressure from the hydraulic system before servicing.
- Allow fluid to cool before working on system.
- Hydraulic fluid escaping under pressure can have sufficient force to enter eyes and penetrate skin. If fluid gets in eyes or skin, flush with large quantities of water and seek medical attention.
- Wear eye protection when servicing hydraulic components or systems.
- Keep all hoses and connections in good serviceable condition. Check before start-up and periodically during operation.
- Do not investigate for leaks with hands. Use a large piece of cardboard.

3.8 FORD 6.0L DIESEL CLUTCH PUMP KIT INSTALLATION

⚠ WARNING Disconnect battery before performing service to prevent accidental startup.

1. Remove the air deflector shield from the top of the fan shroud.
2. Remove the OEM intercooler tube.
3. Unbolt the electrical module (14) from its mounting bracket on the passenger side valve cover. Keep it plugged in and just move it out of the way for now. Unbolt the mounting bracket. It will not be needed again. See figure 2.
4. Remove the OEM belt. The tensioner has a spring to lock it open without any tension. Remove two bolts mounting the tensioner. Just let it lay against the shroud to allow room to mount the pump bracket.
5. Loosen the battery hold down clamps and slide the battery out toward the fender. Tighten the hold down clamps. Tie the air conditioner line to the positive battery cable running down the rear of the battery. See figure 3.
6. Slip the small hose insulation sheath (15) over the pressure hose. Slip the large hose insulation sheath (16) over the suction hose. Place the sheaths where the hoses run close to the exhaust to protect the hoses from the heat. Route the hoses back to the firewall and down running them outside the frame.
7. Mount pump (4) onto bracket (1) with the two 3/8 x 1 1/4 bolts (9) with two 3/8 flat washers (10). Install the adapter into the inlet and outlet ports in back of the pump. Connect the hoses to the pump. Mount the bracket onto the engine with the four M10 x 45 bolts (7). Reattach OEM tensioner with the OEM bolts.
8. Mount the DewEze electrical module bracket (2) onto the front of the pump bracket at location G with the two 1/4 x 3/4 bolts (11). Attach the electrical module (14) to its bracket with two 1/4 x 1 bolts (12) and two 1/4 nuts.(13)
9. Mount the 3" diameter slotted-face idler pulley (6) to the boss on the pump bracket at location F with an M10 x 40 Torx head shoulder bolt (8). Mount the 2.50" diameter smooth-faced idler (18) to the boss at location E with an M10 x 40 Torx head shoulder bolt.(8)
10. Mount the clutch coil (5a) to the pump bracket with four 1/4 x 1/2 flange bolts (5b). Mount the clutch pulley (5c) to the pump shaft with the 5/16 x 1 1/4 bolt (5d) and heavy flat washer (5e) making sure the key is in place on the shaft.
11. Install the belt as (19) shown in the diagram (Fig. 3). Release the lock on the tensioner to tighten the belt.
12. Slit the 4" long hose (17) lengthwise in one wall if it is not already slit. Slip the hose over the top of the pump bracket. Install the DewEze intercooler

tube (3) into the same location as the OEM tube was. It may be necessary to loosen the hose clamp on the rubber elbow on the turbo (location H) so the elbow can be rotated to line up with the intercooler tube. Secure the tube with the OEM hose clamps.

13. Hold the deflector shield in place on top of the fan shroud before snapping into place, noting where it contacts the intercooler tube or the clutch pulley. Trim away that portion of the shield. Snap the shield into place making sure it does not make contact. See figure 3.
14. Reconnect the battery.
15. Run the engine and check for any clearance or alignment problems. Adjust as needed

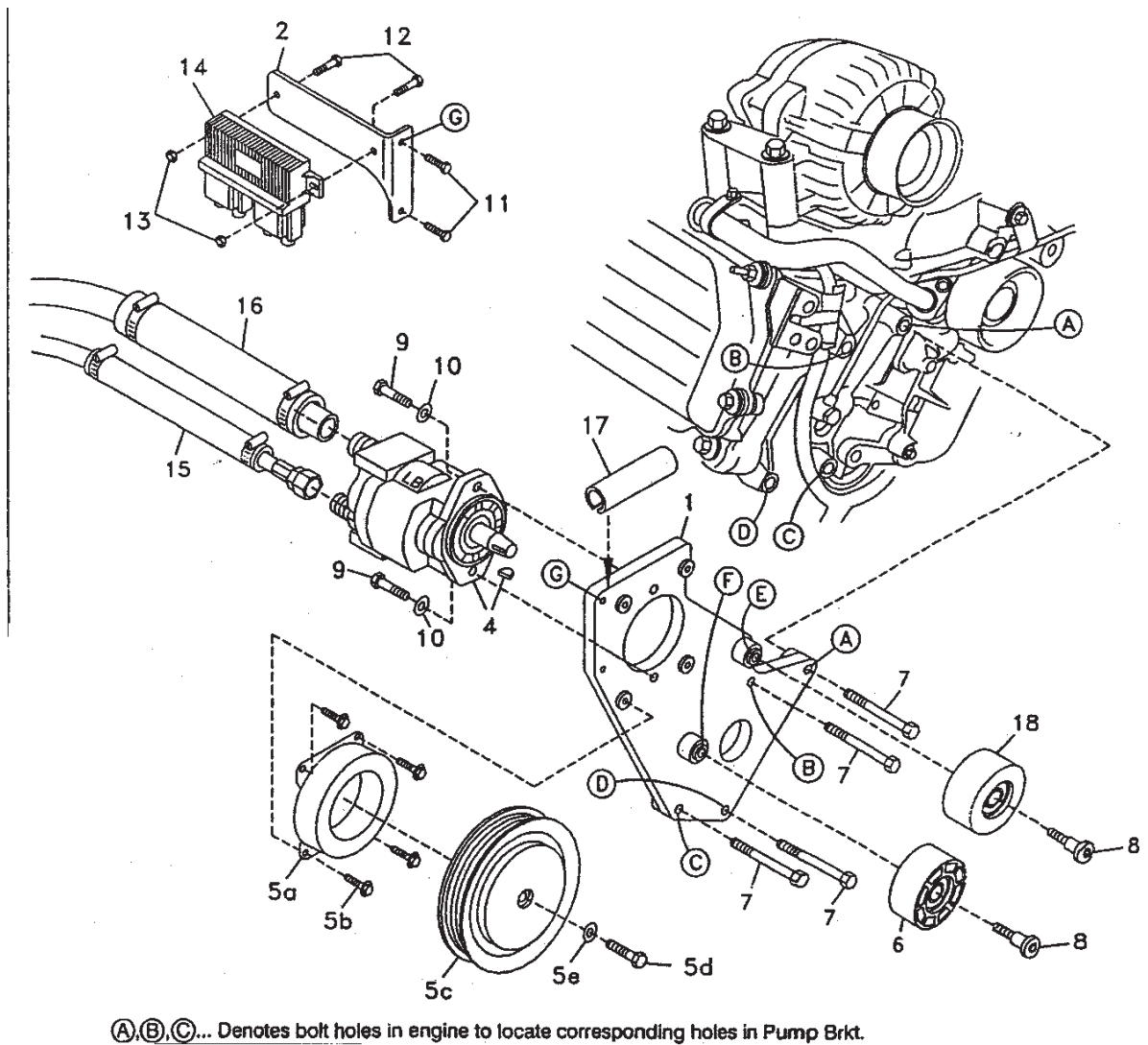
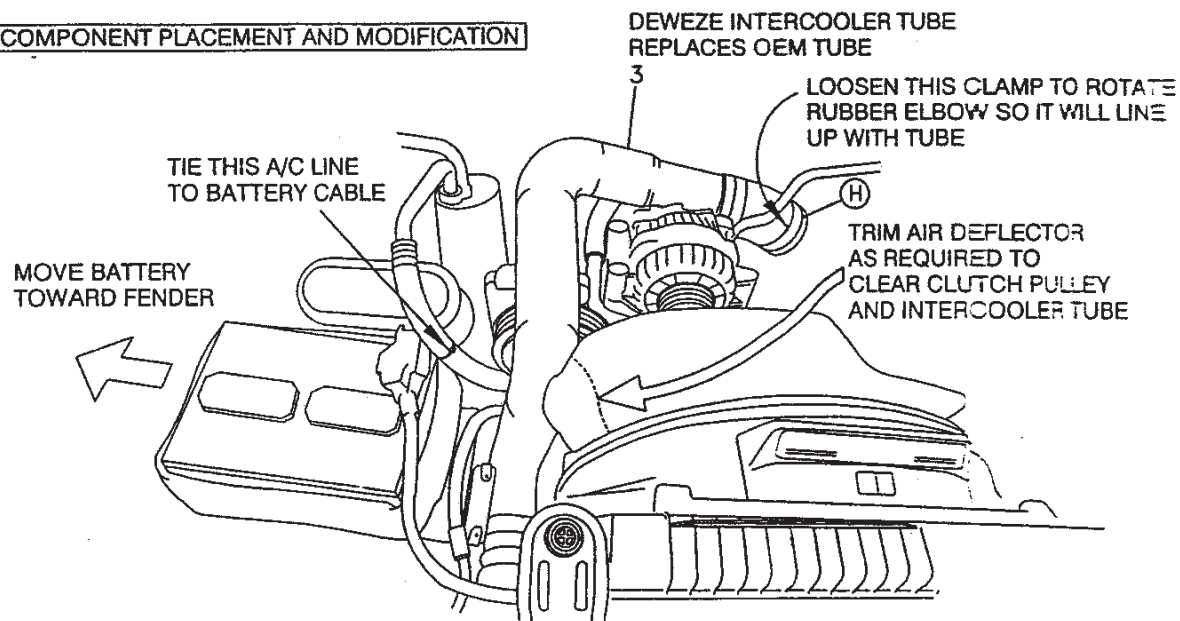


FIGURE 2. FORD 6.0L DIESEL CLUTCH PUMP KIT

COMPONENT PLACEMENT AND MODIFICATION



BELT DIAGRAM

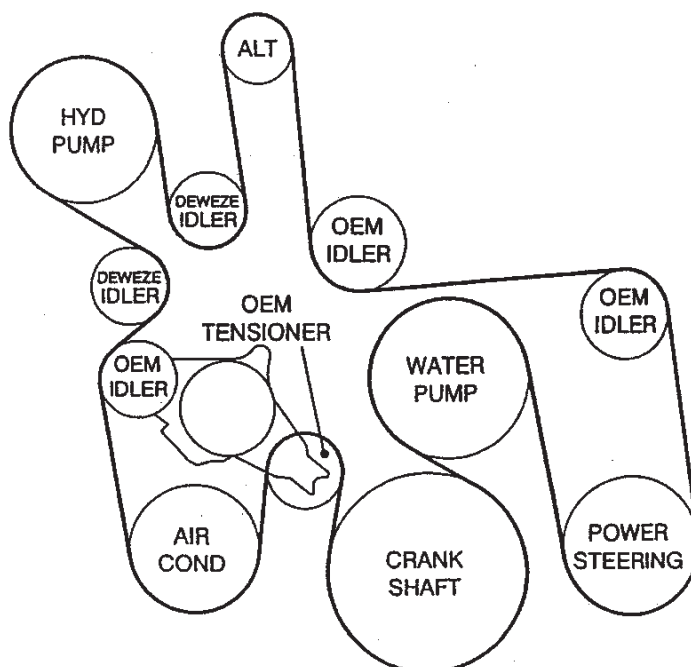


FIGURE 3. FORD 6.0L DIESEL CLUTCH PUMP KIT

3.9 F350 V8/GAS CLUTCH PUMP INSTALLATION

⚠ WARNING Disconnect battery before performing service to prevent accidental startup.

1. Drain the radiator.
2. Remove the upper radiator hose. Make note as to which end is which, as it will be turned around when it is installed later.
3. Remove the fan shroud and fan. Repositioning the air cleaner, are for the 5.4L engine only. Refer to fig. 4. If you have the 6.8L engine, discard the DewEze air cleaner bracket (21).
4. Remove the air filter housing by releasing the large toggle clamp and pulling the front filter housing up and to the rear. Tie the rear of the housing and inlet tube to the rear of the engine compartment to keep it out of the way.
5. Remove the rubber donuts from the OEM air cleaner support and place them in the holes in the DewEze air cleaner bracket (21). Hold this bracket on top of the OEM support placing the small holes in the DewEze bracket in between the large holes in the OEM support. Run the 3/16 x 3/4 self-tapping screws (22) through the small holes into the OEM support.
6. Remove OEM bolts from engine at locations A, B, and C. Lay the wiring off to the side.
7. Remove the wiring harness from the attachment points on the valve cover at the front corner and the stud bolt under the air tube. Push the wiring harness back on top of the valve cover to clear the pump and bracket.
8. Mount the crank pulley (16) to the damper using three M10 x 60 bolts (17), 10mm lock washers (18), and 3/8 flat washers (19).
9. Bolt the pump (6) to the rear of the mounting bracket (1) using two 3/8 x 1 1/4 bolts (13) and two 3/8 flat washers (14). Attach the clutch coil (7) to the front of the bracket using four flange bolts supplied with the clutch. Insert the coil wire through the 1/2" hole right above the coil to keep it from contacting the clutch pulley.
10. Attach the flat idler pulley (3) to the tensioner arm (2) with the 7/16 x 1 3/16 flange bolt (10). Mount the tensioner assembly on the pump bracket at location E with one 1/2 x 3 1/2 bolt (12), inserting the bolt head on the back of the tensioner into the small hole on the tensioner mounting pad.
11. Insert an M10 x 60 bolt (11) through an idler bushing (15) and into a serpentine idler also. Mount one idler onto the boss at location D and the other idler on the boss at location G.
12. Mount the pump bracket onto the engine at locations A, B, and C with the three M10 x 110 bolts (8) with 3/8 flat washers (14). Torque these bolts to 30-41 ft/lbs.

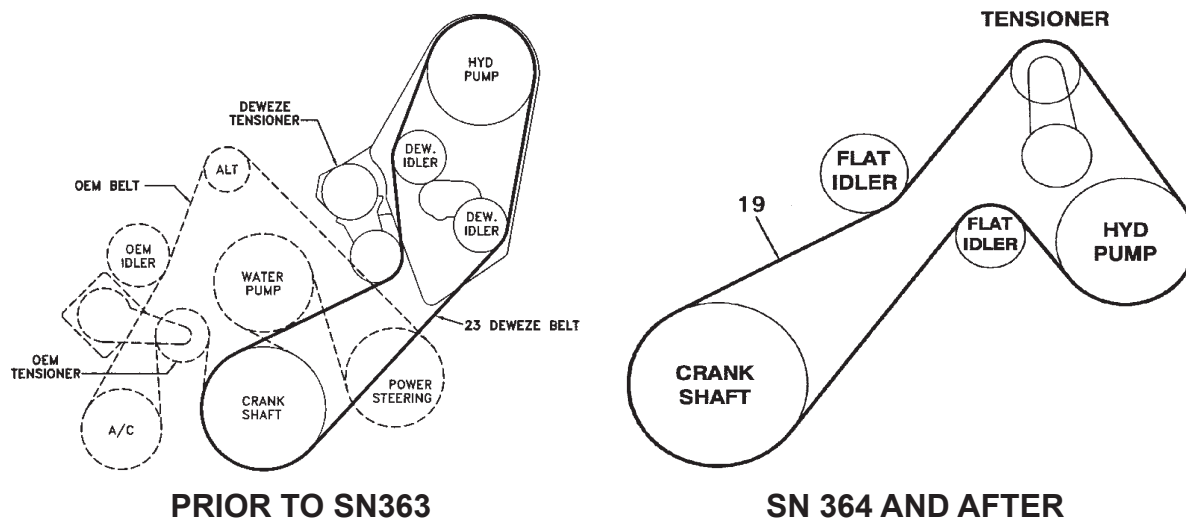


FIG. 3
AIR CLEANER
REPOSITIONING FOR
5.4L ENGINE ONLY

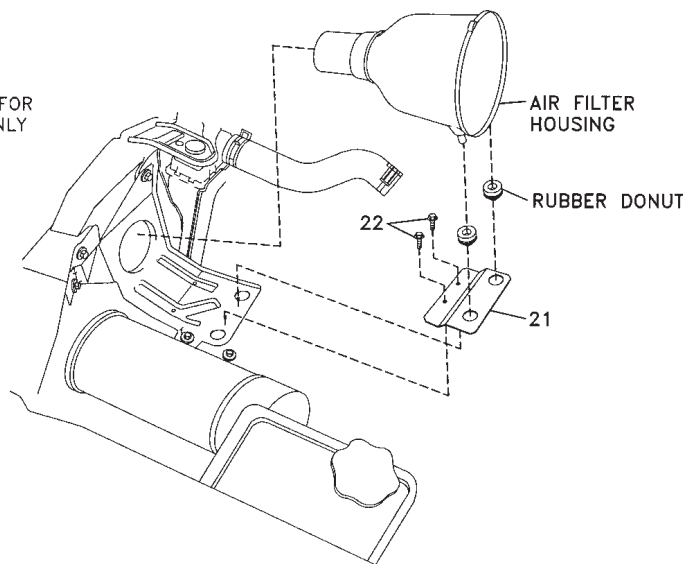


FIGURE 4. F350 V8/GAS CLUTCH PUMP INSTALLATION

13. Bolt the wiring harness holder to the back of the pump bracket at location F using a 5/16 x 3/4 bolt (9).
14. Mount the clutch pulley (7) onto the pump shaft using the bolt and washer supplied with the clutch.
15. Install the pump drive belt (21) making sure pulleys are aligned and the belt runs true.
16. Replace the fan and fan shroud.
17. Replace the upper radiator hose, turning the ends opposite from the way it was originally. This is to give enough clearance between the clutch and the hose.

18. Replace the air filter housing and filter into the hose in the front of the truck then push it down into the rubber donuts in the new location. Untie the rear housing and clamp it to the front half.
19. Replace the coolant in the radiator.
20. Reconnect the battery.
21. Run the engine and check for alignment and clearance problems.

3.10 DEWEZE, FORD 5.4L, 2007+ CLUTCH PUMP INSTALLATION

This installation procedure is included in Chapter 5, DewEze 2007+ Pump Clutch Kit Installation, Part No. 308703

3.11 ADDITIONAL DEWEZE CLUTCH PUMP KITS

See chapter 5

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4 REPAIRS

⚠ WARNING Perform lockout/tagout procedures before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could cause serious injury or death.

The water service truck will normally require very few adjustments during its service life. This section will not cover instructions for the engine, drive train, instruments and cab, brakes, and suspension systems. These are covered in the chassis manufacturer's (Ford Motor Co.) shop manuals.

⚠ WARNING Any brake service, other than periodic inspection or bleeding, should be performed only by personnel specially trained in brake service. Improper and poor quality service procedures can result in brake system failure, loss of vehicle control, and personal injury.

4.1 HYDRAULIC PUMP DRIVE BELT

Refer to the Ford operator's manual included with your unit.

NOTICE! Excessive wear and breakage may occur if belt is adjusted too loose or too tight.

4.2 FORD AUXILIARY POWERTRAIN CONTROL (APC) MODULE

4.2.1 96/97 7.3L Diesel

Programming Instructions

The APC module that is provided with new units has already been programmed at the NMC-Wollard, Inc. factory, but if you purchase a new one or somehow lose your factory-set program, follow these procedures.

By following these instructions you will:

Disable the Manual RPM Control and charge Protection modes.

Enable Fixed RPM Control mode.

Activate Power-Up RPM mode.

Set Power-Up engine speed to 1500 RPM on Memory #1.

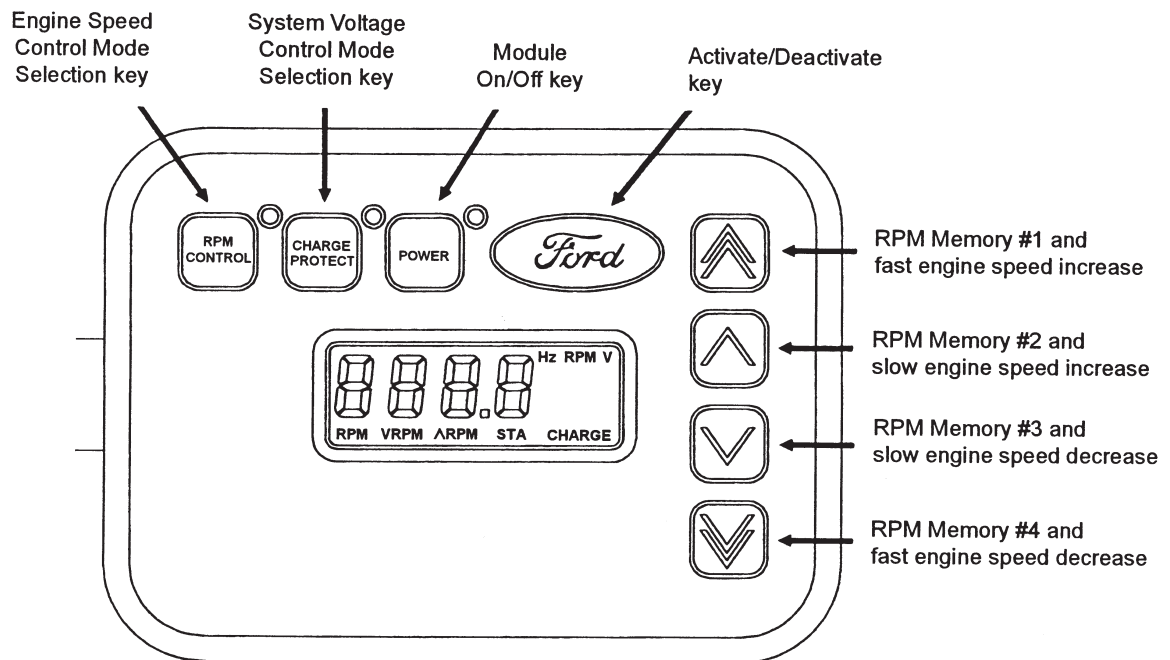
Set Ramp-Up rate to maximum allowable on Memory #1.

Setting Mode of Operation

1. Shift transmission to "Park".
2. Set parking brake.
3. Turn ignition to "Run" position (do not start engine).
4. Have an assistant hold the Water Pump switch on. Make sure that the light next to the "POWER" key is lit and that "0" (zero) is displayed.
5. Simultaneously, press the "Ford", RPM CONTROL, and CHARGE PROTECT keys until display changes to programming mode (about 3 seconds).
6. Press and hold any arrow key until VRMP and ARMP disappear from the bottom of the digital display window. Manual RPM Control is now disabled.
7. Press the "Ford" key. The "V" in the upper right corner of the digital display window should now be flashing.
8. Press and hold any arrow key until CHARGE disappears from the lower right corner of the digital display window. Charge Protection is now disabled.
9. Press the "Ford" key. The "RPM" in the lower left corner should now be flashing.
10. Press and hold any arrow key until "RPM" appears in the upper right corner of the digital display window. Fixed RPM Control is now enabled.
11. Press "Ford" key. "BASE" or "A Sr" should appear in the display.
12. Press and hold any arrow key until "A Sr" appears. Power-Up RPM Mode is activated. The following step will complete the programming procedure.
13. Press "Ford" key. Check for "0" (zero RPM) in the display.

RPM and Ramp Rate Memory Re-Programming

1. Shift transmission to "Park".
2. Set parking brake.
3. Turn ignition to "Run" position (do not start engine).
4. Have an assistant hold the Water Pump switch on. Make sure that the light next to the "Power" key is lit and that "0" (zero) is displayed.
5. Simultaneously, press the "Ford" and RPM CONTROL keys until display changes to programming mode (about 3 seconds). The currently programmed RPM for Memory #1 will be displayed.



6. Press and hold the up or down arrow keys as desired to set Memory #1 RPM to "1500". The Power-Up RPM Value is now set.
7. Press the "Ford" key. "RPM" in the bottom of the digital display window should be blinking.
8. Press and hold either up arrow key until display reads "888" (maximum ramp up rate). The Ramp-Up Rate is now set to the maximum allowable. The following steps will complete the programming procedure.
9. Press "Ford" key. "VRMP" in the bottom of the digital display window should be blinking.
10. Press "Ford" key. Check for "1500" (RPM) in display.
11. Simultaneously, press "Ford" and RPM CONTROL keys until: The light next to the RPM CONTROL key goes out, the POWER light stops blinking and the display reads "0" (zero RPM).

4.2.2 1999-Future 7.3L Diesel

PROGRAMMING INSTRUCTIONS

For programming changes not listed here, refer to Ford manual "Operating Instructions for the Auxiliary Idle Control Module" furnished with each unit

By following these instructions and the figure below you will:

- Activate Power-Up RPM mode.
- Set Power-Up engine speed to 1200 RPM on Memory #1.
- Set Ramp-Up Rate to maximum allowable on Memory #1.

Setting Mode of Operation for Automatic Power-up RPM Control:

1. Shift transmission to "Park".
2. Set parking brake.
3. Turn ignition to "Run" position (do not start engine).
4. Have an assistant hold the Water Pump switch on. Wait until the display changes to "0" (zero) and all lights stop blinking. Make sure the "POWER" light is on.
5. If the "RPM CONTROL" light is on, press the "RPM CONTROL" key until it goes off. If the display says "CHARGE", press the "CHARGE PROTECT" key until the display changes.
6. Simultaneously press and hold "RPM CONTROL", "CHARGE PROTECT" and "FORD" keys until lights blink (about 3 seconds).

- Main Programming Mode is now active.
- Menu #1 is now displayed.

(Release keys immediately or you will exit this mode).

7. Press any "Arrow" key until the display changes to "A Sr".
(It will cycle "BASE" to "A CP" to "A Sr" and repeat).
8. Save by pressing "FORD" key once.
 - Automatic Power-up RPM control is now activated.
 - Menu #2 is skipped and Menu #3 is now displayed.
9. The values in Menus #3 and #4 do not matter, so press the "FORD" key twice. Menu #5 is now displayed.
10. Press any "Arrow" key until display changes to "BASE". (It will cycle "BASE" to "CUST" and repeat).
11. Save by pressing "FORD" key once.
 - Main Programming Mode is now exited.
 - Display changes to "0".
 - The "RPM CONTROL" light will now flash and then stay on.

RPM Memory and Ramp-up Rate Re-Programming:

12. Perform steps 1 through 4 above (or continue from above as follows).
13. If the "RPM CONTROL" light is on, press the "RPM CONTROL" key until it goes off. If the display says "CHARGE", press the "CHARGE PROTECT" key until the display changes.
14. Simultaneously press and hold "RPM CONTROL" and "FORD" keys until you see 2 lights blinking (about 3 seconds).
 - RPM Programming Mode is now activated.
 - The currently programmed RPM value for Memory #1 is displayed on Menu A.

(Release keys immediately or you will exit this mode).
15. Simultaneously press the "FORD" key and the "RPM Memory #1" (Arrow) key to ensure you are programming Memory #1.
16. Use "Arrow" keys to set RPM as close to 1200 as possible.
17. Save by pressing "FORD" key once.
 - The Power-up (Memory #1) RPM value is now set.
 - Menu B is now displayed.
18. Check that display shows "RMP" on the bottom line (if not, press "FORD" key until this menu is displayed), then press either "Up" Arrow key until display reads "8888".
19. Save by pressing "FORD" key once.
 - Ramp-up Rate has now been set to the maximum for Memory #1.
 - Menu C is now displayed.

Auxiliary Idle Control Module Quick Reference Guide



To maintain battery voltage: (This is Charge Protection.)

- Press [Charge Protect] key^{/A}
⇒ Charge Protect light blinks. High idle speed. Voltage displayed.

To get a high idle speed: (This is RPM Control.)

- Press [RPM Control] key
Use [Arrow] keys to select other RPM memory presets.
- Press [Ford] key^{/A}
Use [Arrow] keys to adjust engine speed manually (up/down fast/slow).
⇒ RPM Control light blinks. High idle speed. RPM displayed.

To turn on a Power Take-Off: (This is PTO Control.)

- Press [PTO CONTROL] key to turn on PTO output, press again to turn off.
⇒ PTO Control light on. PTO output on.

To adjust engine idle remotely: (This is Custom RPM Control.)

- Program Custom RPM. Install remote switches. RPM Control light is on. Display shows speed. If "OFF" is displayed, the input voltage is out of range.
- Adjust input voltage to the desired speed
- Press [Ford] key^{/A}
⇒ RPM Control light blinks. High idle speed. RPM displayed.

^{/A} Or optional remote installed switch

If programmed for Automatic RPM Control or Automatic Charge Protection, the high idle function will be active when the vehicle enabling conditions* are met.

To go back to normal idle:

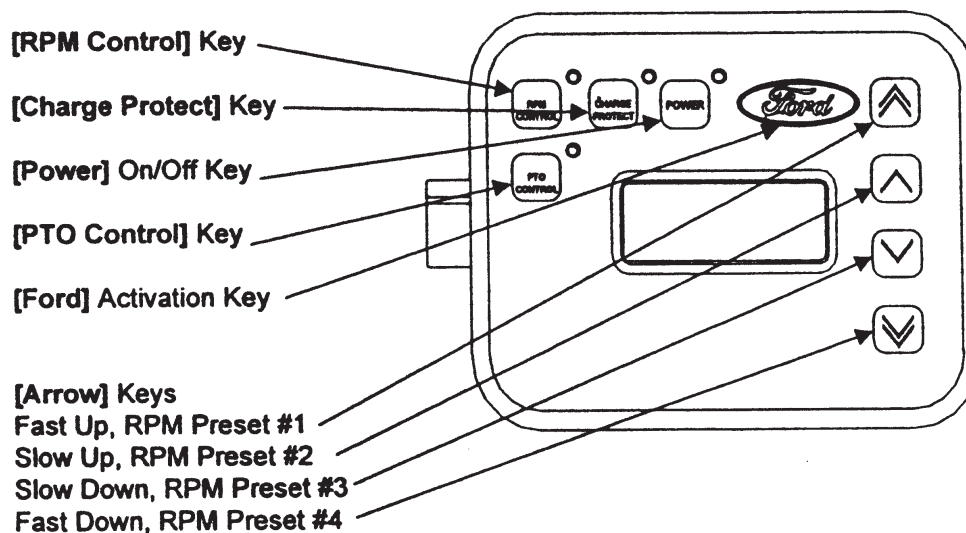
You can do ANY ONE of the following:

- Press key for the function in use (key will be lighted and blinking)
- or • Press [Ford] key^{/A}
- or • Press brake or clutch pedal, take out of PARK, or release parking brake
- or • Press [Power] key (module is turned off)

Vehicle Enabling Conditions* - ALL must be met for any high idle mode.

1. Set parking brake
2. Put gear in park for automatic transmissions
3. Foot off clutch pedal for manual transmissions
4. Foot off service brake
5. Foot off accelerator pedal
6. Brake lights connected and functional

Auxiliary Idle Control Module Quick Reference Guide - Programming



Main Programming Mode

Press and hold [RPM Control], [Charge Protect], and [Ford] keys for 3 seconds.

- [Ford] key saves entry and moves to the next menu.
- Any [Arrow] key will toggle between options in each menu.
- To exit, move through all 5 menus or repeat entry process.

Menu 1	Automatic modes	(Base, Auto CP, OR Auto RPM)
Menu 2	PTO/RPM Linked	(Is PTO Linked to RPM? No OR Yes)
Menu 3	Lower PTO RPM Limit	(Variable, 1000 RPM default)
Menu 4	Upper PTO RPM Limit	(Variable, 3400 RPM default)
Menu 5	Custom RPM	(Base RPM Control OR Custom RPM)

RPM Preset Programming Mode

Press and hold the [RPM Control] and [Ford] keys simultaneously for 3 seconds.

- [Arrow] keys adjust RPM Memory Preset #1
- Press [Ford] key to save and go to next menu
- For another memory preset, press [Ford] and [Arrow] key simultaneously
- To exit, press [RPM Control] and [Ford] keys simultaneously for 3 seconds

Ford Part No. XC3F-12B639-AA

Wiring Schematic Detail

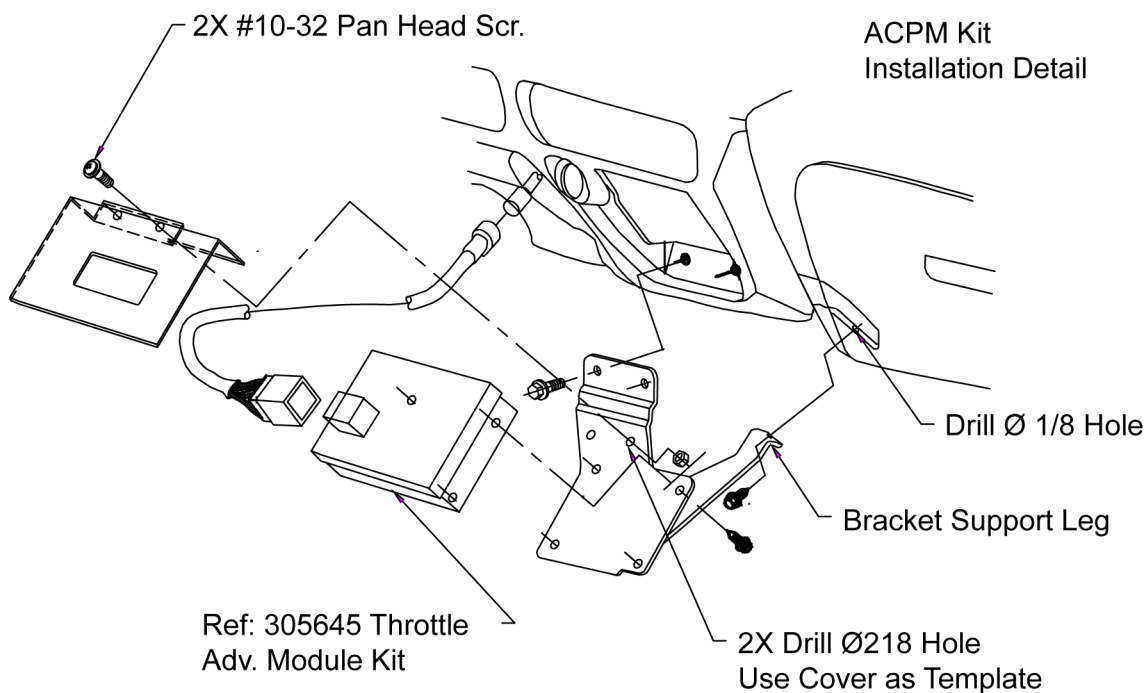
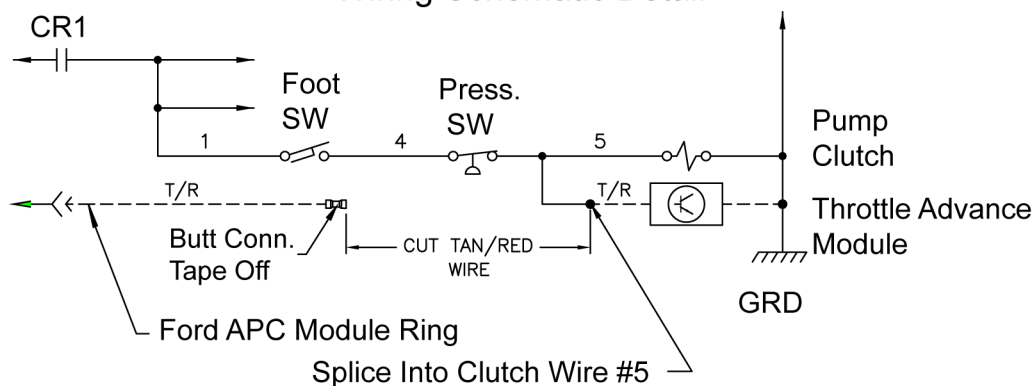


FIGURE 1. TRUCK PREP, F350 DIESEL, 1999 AND LATER, 2 OF 3

20. Check that the display shows "RMP" on the bottom line (if not, press "FORD" key until this menu is displayed). If display does not read blank or "1", use "Arrow" keys to set value to "1". (This setting should not normally need re-programming, as Ford does not recommend values higher than "1").
21. Save by pressing "FORD" key once.
 - Ramp-down Rate has now been set to the default for Memory #1.
 - Menu A is now displayed.
22. Exit the RPM programming mode by pressing the "POWER" key.

All programming is now complete. Switch off ignition.

APCM KIT INSTALLATION DETAIL, 1 OF 2

Installation Instructions for APCM Kit

1. Remove the ashtray from the instrument panel
2. Remove the two existing screws from the instrument panel at the ashtray.
3. Attach the module bracket to the instrument panel at the ashtray using the two existing screws.
4. The bracket support leg requires a hole to be drilled in the instrument panel, with the bracket attached at the ashtray, locate and mark the necessary hole position, remove the bracket for ease of drilling.
5. Drill 1/8" hole in instrument panel.
6. Using the four (4) screws provided, attach the APC module to the Module bracket.
7. Re-tighten the two existing screws at the ashtray.
8. Attach wiring harness connector to mating connector under instrument panel and attach the other end to the APC Module.
9. Cut tan/red wire in module harness.
10. Using a butt connector, connect module side of tan/red wire to wire #5 of control wiring assembly. (See Wiring Schematic Detail).
11. Put a butt connector on dash side of tan/red wire and tape off. (This wire is not used.)
12. Replace ashtray.

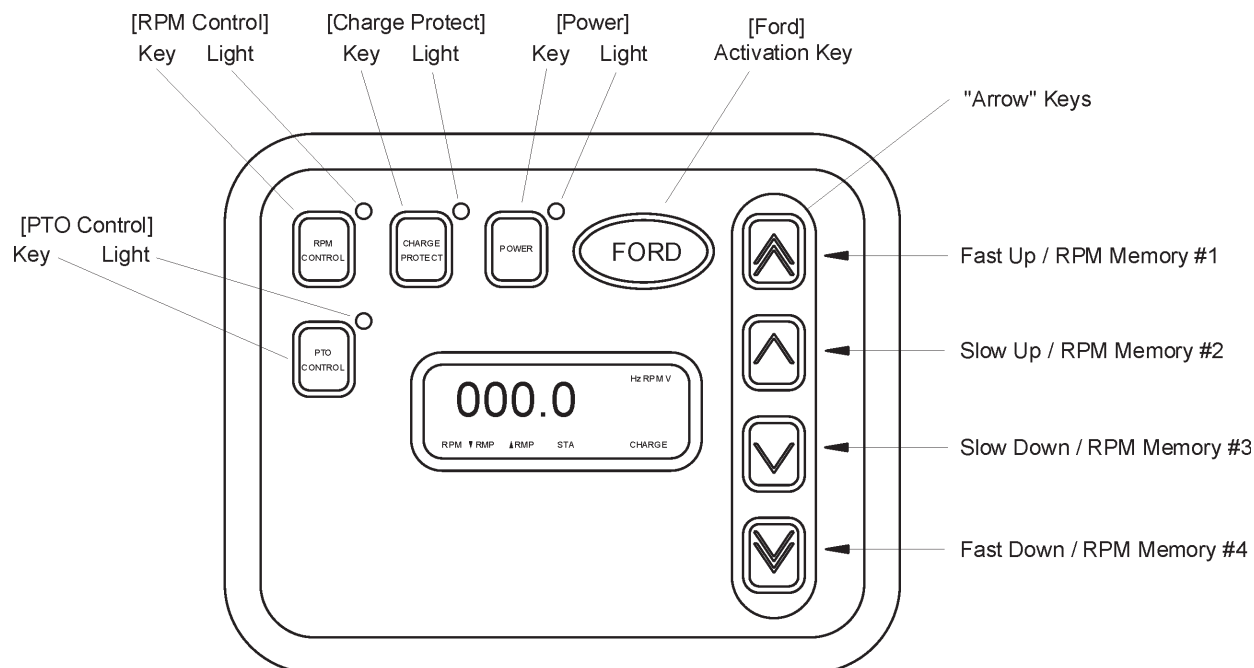


FIGURE 2. TRUCK PREP, F350 DIESEL, 1999 AND LATER, 3 OF 3

4.3 PUMP IN PARK ONLY OPTION

1. Remove access cover from driver's side of morse control tower.
2. Switch actuator arm from handle quadrant must be connected in #6 hole as shown in figure 3.
3. Adjust switch (at mounting bracket) as shown in figure 3, checking for continuity between green and white wires.
4. Locate control relay CR1 in engine compartment above right front wheel well.
5. Locate terminal strip mounted adjacent to CR1. Check that the green wire from the morse shifter switch has power at all times, except when the ignition is off.
6. Test operation of pumping system and verify that it will only operate in Park. Replace access cover on Morse control tower.

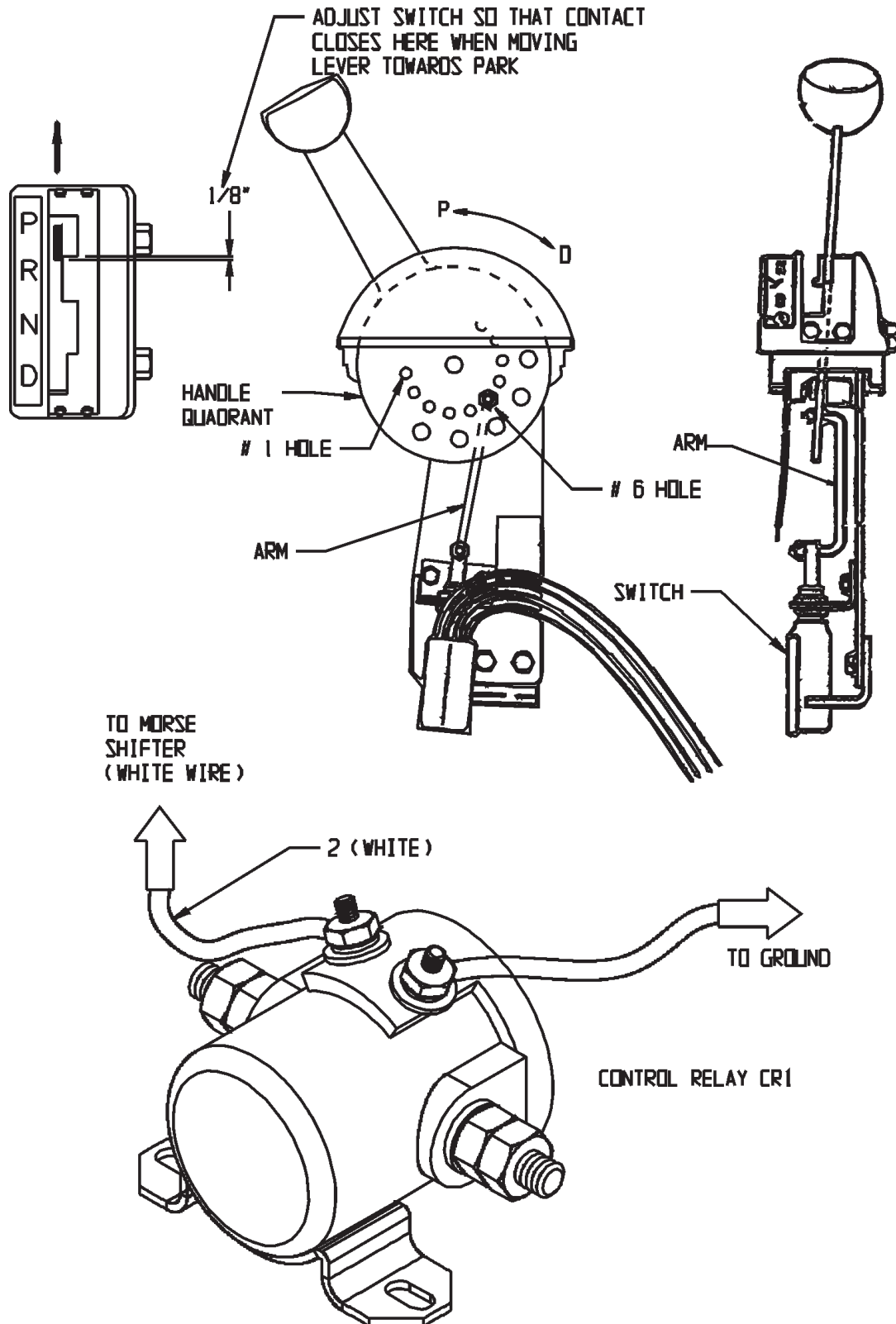


FIGURE 3. PUMP IN PARK ONLY (VIEW FROM DRIVER'S SIDE)

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CHAPTER 3 OVERHAUL/MAJOR REPAIR

TABLE OF CONTENTS

1 GENERAL REPAIRS.....	1
1.1 GENERAL INFORMATION.....	1
1.2 TRUCK CHASSIS.....	1

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1 GENERAL REPAIRS

⚠ WARNING Perform lockout/tagout procedures before adjusting, lubricating, cleaning or otherwise servicing. Failure to do so could result in unexpected startup and could cause serious injury or death.

1.1 GENERAL INFORMATION

The only components that may be overhauled are the hydraulic pump, hydraulic motor, hydraulic valve, and water pump.

In most cases, the time and material cost of overhaul makes replacement a better option. If your troubleshooting and inspection shows that a component is faulty, we recommend removing and replacing the component.

Any overhaul information will be found in Chapter 5 Manufacturers' Information.

1.2 TRUCK CHASSIS

The truck chassis manufacturer (Ford) has overhaul manuals available. Contact your local Ford parts dealer.

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CHAPTER 4 REPAIR PARTS

SECTION 1 HOW TO USE THE REPAIR PARTS CHAPTER	1
SECTION 2 LIST OF VENDORS	1
SECTION 3 NUMERICAL PART NUMBER LIST	1
SECTION 4 ILLUSTRATED PARTS LIST	1
305813 WORKLIGHT RELOCATION , OPTION	247
ALARM, BACKUP OPTION.....	114
ANTI-SKID TOP DECK, OPTION.....	236
ASSEMBLY, LED FLOODLIGHT,W/FIXED BASE.....	243
ASSEMBLY, LED FLOODLIGHT, W/SWIVEL BASE	244
BEACON, ROTATING, AMBER, OPTION	60
BLOCK HEATER OPTION, DIESEL, 96/97.....	142
BLOCK HEATER OPTION, GAS, 96/97.....	144
BLOCK HEATER OPTION, GAS, 99 & LATER	140
BODY MARKERS, OPTION	56
BODY, OUTER, OPTION.....	164
BRAKE LOCK, MICO LEVER, OPTION.....	58
BREAKAWAY KAISER COUPLING OPTION.....	116
BUMPER, HEAVY DUTY OPTION, F350, 1999-2000	145
BUMPER HEAVY DUTY, OPTION, F350, 2000+	146
BUMPER HEAVY DUTY, OPTION, F350, 2009+	147
BUMPER HEAVY DUTY, OPTION, F350, 2010+	148
BUMPER, RUBBER, OPTION	150
BUMPER W/ PLATFORM, REAR OPTION.....	149
CAB FLOOR PLATES,OPTION, 99 & LATER.....	180
CAB ROTATING BEACON, OPTION	198
CLUTCH, MAG, 8-GROOVE.....	30
COUPLING, BREAKAWAY, A/C END, OPTION	116
CYLINDER ASSEMBLY LIFT	96
DECALS, US AIR, OPTION.....	182
DOOR LOCK DEACTIVATION OPTION, 96/97	188
DOOR LOCK DEACTIVATION OPTION, 99 & LATER	190
DRAIN, REMOTE,OPTION, 1.5"	184
ELECTRICAL ASSEMBLY, 96/97	46
ELECTRICAL ASSEMBLY, 99 & LATER	48
ELECTRICAL ASSEMBLY, 402 SIDE DOORS	50
FILL PORT WITH BACKFLOW, OPTION.....	40
FIRE EXTINGUISHER, OPTION.....	172
FORD 6.0L DIESEL CLUTCH PUMP KIT	208
FUEL TANK FILL PIPE, 96/97	52
GATE PLATE, OPT, DNR F350, 99 & LATER	202
GOVENOR, F350 GAS, 2005 & LATER.....	222
GOVERNOR, 350/V8 GAS, OPTION 02 & LATER	152
GOVERNOR OPTION F350, 96/97.....	154
GOVERNOR WITH FUEL INJECTION, OPTION, 99 & LATER.....	152

GRIPSTRUT, OPTION, 96/97	170
GRIPSTRUT, TOP REAR, OPTION	166
GRIPSTRUT, TOP REAR, W/ LT OPTION, 402	168
HEAT, 402, 120V & 12V OPTION	108
HEAT OPTION, 120V/240 & 12V	104
HEAT OPTION, 120V/240 & 12V	106
HEAT TRACE, DRAIN OPTION	110
HEAT WIRING AND HOSES ONLY OPTION	112
HIGH WATER TEMP SHUTDOWN W/ LOW OIL SHUTDOWN OPT, DIESEL, F350/F450, 99 & LATER	160
HOSE, REAR EXIT, OPTION	172
HOURLY METER INSTALLATION OPTION, DIESEL, 99 & LATER	102
HOUR METER OPTION, 95 & EARLIER	98
HOUR METER OPTION, GAS, 96/97	100
HYDRAULIC INSTALLATION W/O LIFT OPTION	26
HYDRAULIC INSTALLATION W/O LIFT OPTION	28
HYDRAULIC INSTALLATION W/ REAR BUMPER MOUNTED LIFT	90
HYDRAULIC INSTALLATION W/ REAR TOP MOUNTED PERSONNEL LIFT	74
HYDRAULIC INST. W/ SIDE COMPARTMENT DOORS AND W/O LIFT	8
HYDRAULIC INST. W/ SIDE COMPARTMENT DOORS AND W/O LIFT	10
LED WORKLITE, OPTION	242
LIFT, REAR BUMPER OPTION, BUMPER	84
LIFT, REAR BUMPER OPTION, CONTROL BOX ASSY	80
LIFT, REAR BUMPER OPTION, ELECTRIC INSTALLATION	76
LIFT, REAR BUMPER OPTION, ELECTRIC INSTALLATION	78
LIFT, REAR BUMPER OPTION, GROUND CONTROL BOX	82
LIFT, REAR BUMPER OPTION, LOWER SCISSORS SUB ASSEMBLY	88
LIFT, REAR BUMPER OPTION, UPPER SCISSORS SUB ASSEMBLY	86
LIGHTS, BACK-UP, OPTION	64
LIGHTS, CANADA, TWS402, OPTION	186
LOW OIL PRESS SHUTDOWN, OPTION 96/97	134
LOW OIL PRESSURE SHUTDOWN OPTION, GAS, 99 & LATER	136
LOW OIL SHUTDOWN, GAS/DSL	224
LOW OIL SHUTDOWN OPTION, DIESEL F350/F450, 99 & LATER	138
MORSE CONTROL, OPTION - 97, DIESEL	226
MORSE CONTROL OPTION, 1997 CHASSIS AND LATER	120
MORSE CONTROL OPTION, 1997 CHASSIS AND LATER	122
MORSE CONTROL OPTION, DNR, 99-2000	126
MORSE CONTROL, OPTION, DNRP, 99 & LATER	124
MORSE CONTROL OPTION, THROUGH 1997 CHASSIS	118
NEUTRAL INTERLOCK, 2ND, F350/F450, GAS/DIESEL, 99 & LATER	192
PAD, BRAKE PEDAL, GRIPSTRUT, F350, OPTION	246
PARKING BRAKE INTERLOCK, OPTION	200
PARKING BRAKE, OPTION	200
PERSONNEL LIFT ASSEMBLY, TOP MOUNTED	66
PERSONNEL LIFT, TOP MOUNTED, ELECTRICAL ASSEMBLY	72
PERSONNEL LIFT, TOP MOUNTED, HADRAIL ASSY	68

PERSONNEL LIFT, TOP MOUNTED, LIFT SCISSORS ASSEMBLY	70
PLACARD ASSEMBLY	54
PREPARATION, ENGINE 96/97	14
PREPARATION, TRUCK 96/97	12
PUMP IN PARK ONLY, OPTION KIT	210
PUMP KIT, F350, 6.4 DIESEL, 2008 & LATER	232
PUMP KIT, F350, 6.7 DIESEL, 2012	234
PUMP KIT W/CLUTCH, F350, GAS, 2009	216
PUMP KIT W/CLUTCH, F350, GAS, 2011	218
PUMP KIT W/ CLUTCH, F350, V8 GAS 2007+	240
PUMP KIT W/ CLUTCH, F350, V8 GAS 2014+	220
PUSH BUTTON STATION, WATER PUMP OPTION	162
REEL, REAR ACCESS, OPTION	174
SHUTOFF, NOZZLE END, 3/4" HOSE, OPTION	176
SKID KIT, OPTION	194
STAIR, REAR, OPTION	178
STARTER PROTECTION, F350/F450, DIESEL, 1999 & LATER, OPTION	132
STARTER PROTECTION, OPTION GAS 99 & LATER	130
STARTER PROTECTION OPTION, GAS & DIESEL, 96/97	128
SWITCH, IGNITION, OPTION, COLE HERSEE, 99 & LATER	158
SWITCH, IGN,OPTION, COLE HERSEE, 1997 & EARLIER	156
TANK VACUUM RELIEF, OPTION	236
TANK, VENT/FILL COUPLING, OPTION	196
TOW HOOKS, FRONT, OPTION	204
TRUCK CHASSIS, F350, V10 GAS - 02 & LATER	206
TRUCK PREP, F350, 6.0 DIESEL, 2005 & LATER	228
TRUCK PREP, F350, 99 & LATER	20
TRUCK PREP, F350 DIESEL, 99 & LATER	18
TRUCK PREP, F350 GAS, 99 & LATER	16
TRUCK PREP, F350, V8 GAS	24
TRUCK PREP, F350, V8 GAS, 2005 & LATER	212
TRUCK PREP, F350, V8 GAS, 2005 & LATER	214
TRUCK PREP, F350, V8 GAS 2007+	238
TRUCK PREP, F350 V10 GAS, 99 TO 01	22
WATER PLUMBING INSTALLATION	32
WATER PLUMBING INST. WITH PUSH BUTTON PUMP START OPT.	42
WATER PLUMBING INST. W/PUSH BUTTON, PUMP START OPT, & FILL PORT OPT 305345	36
WATER TRUCK ASSEMBLY WITH REAR COMPARTMENT DOORS	2
WATER TRUCK ASSY W/SIDE COMPARTMENT DOORS	6
WHEEL CHOCKS W/TRAY MID SIDE, OPTION	245

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SECTION 1 HOW TO USE THE REPAIR PARTS CHAPTER

To ORDER REPAIR PARTS, call NMC-Wollard, Inc. Customer Service at 1-715-835-3151. Be prepared to supply the model number and serial number of your machine. Inform the Customer Service Representative what page and figure number the part you require is on, along with the date that appears in the footer of the parts page. Then order the part number that is listed for the item you require. For your convenience, Visa and MasterCard are accepted for payment.

VENDOR PART NUMBER column lists the original manufacturers' part numbers of items purchased by NMC-Wollard, Inc.. Although these parts may be purchased from NMC-Wollard, Inc. by using the NMC-Wollard, Inc. part number, you may wish to purchase directly from the original manufacturer.

ABBREVIATIONS may be used in this manual as follows:

A/R - As Required

COMM - commercial item readily available from local sources

DPST - Double-Polesingle-Throw

HHCS - Hexhead Capscrew

ID - Inside Diameter

LH - Left-Hand

NS - Not Shown

OA - Over-All

OD - Outside Diameter

RH - Right-Hand

RHMS - Roundhead Machine Screw

SHCS - Socket Head Capscrew

SPDT - Single-Pole Double-Throw

WLDMT - Weldment

NOMENCLATURE column contains the part description required for identification or procurement. If the part is an item purchased by NMC-Wollard, Inc. and has not been modified by NMC-Wollard, Inc., then following the description will be the vendor's federal supply (CAGE) code. If a vendor does not have a CAGE code, a number will be assigned by NMC-Wollard, Inc. with the prefix letter "V". Example: V1234. Where there is no vendor or CAGE code, NMC-Wollard, Inc. is the manufacturer.

EFF (Effectivity) column identifies by code the model or serial number/s on which a particular part is used. Absence of the code in the "EFF" column indicates that the part or assembly is used on all models with Ser #001 and on.

See Introduction for Effectivity Codes and Serial Numbers

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SECTION 2 LIST OF VENDORS**Cage****Code****Vendor**

V00502	Hydro-Aire Division, Crane Co., (ADEL), 3000 Winona Ave., Burbank, CA 91510
00843	Hoffman Engineering Company, Div. of Federal Cartridge Corporation, 9TH and Tyler Street, Anoka, MI 55303
01276	Aeroquip Corporation, 1225 West Main Street, Van Wert, OH 45891
02249	Gresen Mfg. Company, 600 Hoover Street North East, Minneapolis, MN 55440
02575	American Auto Parts Company, Inc., 1212 East 19TH Street, Kansas City, MO 64108
02892	Hydreco - A Unit of General Signal Corporation, 9000 E. Michigan Avenue, Kalamazoo, MI 49003
03743	Appleton Electric Company, 2205 S. 12 Avenue, South Milwaukee, WI 53172-2541
07131	E. L. Wiegand Division, Emerson Electric Co., (Formerly Chromalox). 2150 N. Rulon White Blvd., Ogden, UT 84404-2646
07988	Fluid Power Systems, Inc., Div. of United Technologies, 511 South Glenn Avenue, Wheeling, IL 90090
13445	Cole Hersee Company, 20 Old Colony Ave., Boston, MA 02127-2405
13445	Truck-Lite Co., Inc., Subdivision of Quaker State Oil, 310 E. Elmwood Ave, Falconer, NY 14733
16016	(Gemco) Magnetek Controls, 1080 N. Crooks Road, Clawson, MI 48017-1097
23040	Ford Motor Company, 3000 Schaefer Road, P. O. Box 1902, Dearborn, MI 48121
23724	Fulflo Specialties Company, Inc., 414 East Fancy Street, Blanchester, OH 45107
23826	Furnas Electric Company, 1004 McKee Street, Batavia, IL 60510
24161	Gates Rubber Company, 999 South Broadway, Denver, CO 80217
28381	Coxwells, Inc., 6000 South Avalon Blvd., Los Angeles, CA 90003-1334
34398	Pitts Industries, 1671 South Broadway, Carrollton, TX 75006
41625	Morse Controls Div. of Incom International, Inc., 21 Clinton Street, Hudson, OH 44236
44185	NMC-WOLLARD, Inc., 2021 Truax Blvd., Eau Claire, WI, 54703
44408	Oberdorfer Foundries, Inc., 4001 Thompson Road, Syracuse, NY 13221
45239	Clippard Instrument Labs, Inc., 7390 Colerain Road, Cincinnati, OH 45239
46576	Perko, Inc., 16490 N. W. 13th Avenue, Miami, FL 33164
49234	Protectoseal Company, 225 West, Foster Avenue, Bensenville, IL 60106
56365	Square D Company, 1415 South Roselle Road, Palatine, IL 60067-7337
70903	Cooper Belden Electronic Wire and Cable, Subdivision of Cooper Industries Inc., 2000 Batavia Ave., Geneva, IL 60134-3325

71400 Bussman Mfg., Div. of Cooper Ind. Inc., 114 Old State Road, St.
Louis, MO 63178

71823 Darnell Corporation Limited, 17915 Railroad Street, City of Industry, CA
91748

72268 Hubbell, Harvey, Inc., 584 Derby Milford Road, Orange, CT 06477-2204

75665 Lovejoy, Inc., 2655 Wisconsin Avenue, Downers Grove, IL 60515-4229

77060 Packard Electric Division, 408 Dana Street NE, Warren, OH 44486

78225 Stant Mfg. Company, 1620 Columbia Avenue, Connersville, IN 47331-1672

78388 Synchro-Start Products, Inc., 8109 North Lawndale Avenue, Skokie, IL
60076-3321

79470 Weatherhead Division, Dana Corp., 6615 Brotherhood Way, Fort Wayne, IN
46825

80089 Essex Electro-Mechanical Division of Hamilton Standard Controls Inc., 131
Godfrey Street, Logansport, IN 46947-1843

80753 Griffin Lamp Company, Highway 61, South Shelby, MS 38774

80883 Hupp Co. Mobile Products Div. (Hadees Heaters), 1135 Ivanhoe Road,
Cleveland, OH 44110-3249

82430 American Valve Manufacturing Co., 170 Mansion St., Coxsackie, NY 12051

82942 Rubatex Corporation, Railroad Avenue, Bedford, VA 24523

86831 (Roylyn) Kaiser Aerospace and Electronics Co.. Orange County Plant, CA
91201

89265 (American Machine & Foundry) AMF Inc., Potter & Brumfield Div., 200
Richland Creek Drive, Princeton, IN 47671

91929 Micro Switch Div. of Honeywell, 11 West Spring Street, Freeport, IL, 61032

92867 Orscheln Co., 1177 N. Morley, Moberly, MO 65270-2736

98847 Marsh Valve Div. of White Consolidated Industries Inc. Sarco, 307-344
Brigham Street, Dunkirk, NY 14048-1947

94227 Scovill, Inc., Nutone Division, Madison and Red Bank Road, Cincinnati, OH
45227

1H2Y5 Harper Industries (Deweze), Harper, Kansas 67058

SECTION 3 NUMERICAL PART NUMBER LIST

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
1.0166	5, 7	1.8278	41	2.2306	73
1.0202	11, 75	1.8294	33, 37, 43	2.2531	47, 49, 51
1.0248	35, 39, 41, 45	1.8317	103	2.2568	99, 157, 159
1.0293	35, 39, 45	1.8318	5	2.2576	73, 77
1.0437	9, 91	1.8388	71, 75, 91, 97	2.2593	105, 107, 113
1.0443	105	1.8426	59	2-2612	135
1.0474	9, 27, 75	1.8450	9, 27, 91	2.2612	101, 115, 133, 137, 139,
1.0519	105	1.8453	9, 93	157, 187, 193, 225	
1.0590	41	1.8552	117	2.2613	99, 101, 103, 157
1.0619	35, 39, 45	1.8608	9, 93	2.2623	47, 49
1.0664	15, 27	1.8623	5	2.2633	157, 159
1.0736	69	1.8672	205	2.2821	81
1.0890	9, 33, 37, 43, 93	1.8674	205	2.2931	105, 107, 113
1.0911	27	1.8789	179	2.3001	59
1.1220	107	1.8832	59	2.3002	77
1.1877	67, 107	1.9008	9, 91, 93	2.3008	77
1.2189	11, 27, 33, 37, 43, 95	2.0176	79, 111	2.3012	73, 79, 83
1.2191	69	2.0177	79	2.3013	47, 49, 107
1.2874	27, 75	2.0178	111	2.3045	77, 79
1.3129	27, 33, 37, 43, 95	2.0180	47, 49, 51, 73, 81, 107	2.3069	187
1.3362	15	2.0181	47, 49, 51	2.3093	77, 129, 131
1.3368	9, 33, 37, 43, 93	2.0192	111	2.3231	73
1.3548	33, 37, 43	2.0215	73	2.3305	59
1.4191	75	2.0348	105, 109, 113	2.3356	51, 81, 163
1.4193	9, 27, 35, 39, 45, 95	2.0356	107	2.3431	79, 111
1.4435	185	2.0358	107	2.3437	121, 125, 127, 227
1.5196	99	2.0435	5, 47, 49, 51, 67, 73, 79	2.3442	47, 49, 51, 73, 79, 81,
1.5782	145, 146, 147, 148, 167,	2.0450	105, 107, 113	107, 111	
169, 171, 246		2.0739	51	2.3467	73
1.5877	27, 75	2.0800	99	2-3478	135
1.5905	99, 101	2.0801	99, 101	2.3478	5, 47, 49, 51,
1.5943	119, 121, 123	2.0865	157	99, 101, 103, 107, 115, 121, 125,	
1.5955	119, 121, 125, 127, 227	2.0890	47, 49, 51	127, 133, 137, 139, 161, 163,	
1.5956	119, 121, 125, 127, 227	2.0891	47, 49, 51, 107	187, 193, 223, 225, 227	
1.6015	119, 121, 125, 127, 227	2.0906	111	2.3500	157, 159
1.7146	27, 75	2.1031	61, 63, 199	2.3506	99
1.7162	9	2-1401	135	2.3511	59, 77
1.7235	3	2.1401	47, 49, 51, 157, 159	2-3550	135
1.7497	71	2.1513	243, 244	2.3550	137, 139, 225
1.7779	187	2.1532	47, 49, 51, 61, 63, 73,	2.3578	187
1.7899	53	161, 199, 223		2.3622	111
1.7935	75	2.1533	73	2.3648	47, 49, 51, 77, 133, 137,
1.7965	85	2.1585	39, 45, 51, 163	139, 163, 213, 239	
1.7969	41	2.1614	99, 159	2.3665	115
1.8110	75	2.1718	47, 49, 51	2.3695	85
1.8154	75	2.1736	33, 37, 43, 47, 49, 51	2.3698	107
1.8264	185	2.1898	123, 211	2.3699	107
1.8265	185	2.1922	47, 49, 51	2-3707	135
1.8266	185	2.1948	47, 49	2.3707	137, 139, 225
1.8267	185	2.1991	51, 73	2.3786	51, 163

CHAPTER 4 REPAIR PARTS**SECTION 3 NUMERICAL PART NUMBER LIST**

APRIL 15, 2014

PAGE 1

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
2.3800	81	3.1075	67, 73	3.2764	185
2.3826	79	3.1076	79	3.2787	33, 37, 41, 43
2.3828	129, 131	3.1081	11, 27	3.2875	11, 17, 23, 27, 75
2.3839	243, 244	3.1084	5, 53, 177	3.2878	91, 97
2.3886	81	3.1085	105, 117	3.2884	17, 23, 25, 27, 207
2.3889	51, 73, 81	3.1086 ...	5, 35, 39, 41, 45, 117,	3.2919	33
2.3905	47, 49, 51	197		3.2934	75
2.3911	61	3.1090	5	3.2959	35, 39, 45
2.3919	51, 81, 163	3.1125	87, 89	3.2961	11, 29, 93, 213, 239
2.3936	81	3.1215	75	3.2963	99
2.3966	163	3.1227	41	3.3003	59
2.3967	163	3.1349	27	3.3051	15, 17, 23, 25, 207
2.3972	133	3-1352	135	3.3061	33, 45
3.0127	27	3.1352	137, 225	3.3067	91, 97
3.0235	27, 75	3.1356	27	3.3125	185
3.0241	9, 27, 75, 91	3.1380	9, 93	3.3136	45
3.0248	9, 27, 93	3.1385	27, 75	3.3189	207
3.0272	29	3.1413	9, 29	3.3191	15
3.0295	71	3.1416	9, 27, 93	3.3326	207
3.0305	3	3.1423	27, 75	3.3348	177
3.0391	3	3.1496	99	3.3350	177
3.0397	59	3.1540	27, 75	3.3356	59
3.0558	33, 37, 43, 163	3.1542	27, 75	8.0156	11
3.0563	33, 37, 43	3.1564	75	9.0006	35, 45
3.0566	9, 33, 37, 43, 93	3.1566	9, 27, 75, 93, 97	9.0027	105
3.0581	45	3.1568	9	9.0077	3
3.0593	9, 33, 37, 43, 93	3.1573	75	9.0365	105, 113
3.0594	33, 37, 43, 45	3.1575	27, 75	9.0884	13, 53
3.0595	33, 45	3.1656	33, 37, 43	9.1571	59
3.0596	33, 37, 41, 43, 45	3.1663	211	9.1841	35, 39, 45, 197
3.0598	33, 37, 43	3.1682	35, 39	9.1940	185
3.0599	33, 37, 43	3.1840	17, 23, 27, 75	9.1941	185
3.0620	33, 37, 43	3.1926	67, 91, 97	9.1975	35, 45, 177
3.0626	33, 37, 43	3.1940 ...	15, 17, 23, 25, 27, 75	9.2009	5
3.0632	35, 45	3.2006	97	560A89	19, 21, 55, 229
3.0633	33, 37, 43	3.2077	33, 37, 43	562A54	55, 105, 109
3.0634	33, 37, 43	3.2096	35, 39, 45	562A181	67, 79, 83
3.0635	33, 37, 43	3.2145	75, 97	562A206	55, 67
3.0640	35, 39, 45, 177	3.2172	9, 27, 75, 91	562A279 ...	17, 23, 25, 55, 207,
3.0642	33, 37, 41, 43, 45, 197	3.2202	59	213, 239	
3.0648	59	3-2283	135	562A282	5, 55
3.0654	3, 35, 45	3.2283	99, 137, 139, 225	562A284	55
3.0660	39, 163	3.2326	207	562A295	55, 77
3.0661	33, 37, 43	3.2335	33, 37, 43, 45	562A317	55, 107
3.0669	35, 39, 45	3.2475	93	562A339	55, 67
3-0802	135	3.2518	75	562A347	55, 135, 137, 139, 225
3.0802	99, 137, 139, 225	3.2625	75	562A408	55, 59
3.0839	59	3.2679	11, 25, 27, 93, 207	562A503	55
3.0889	27, 75	3.2687	27, 59, 75	562A518	61, 63, 199
3.0929	59	3.2703	11, 29	562A546	5
3.0935	27, 75	3.2752	9, 91	1308	3, 7

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
1310.45	3	8807	61	12209	107, 109
1649	3	8873	67, 73	12285	99
2237	5, 7, 55	8874	67, 73	12654.31	41
3093	201	8881	67, 69	12654.32	185
6850.45	53	8883	67	13371	171
6853.27	113	8925	99	13372	151
6855.09	171	8926.8	119, 121	13377	151
6859.08	151	8926.9	119, 121	13657	5, 111, 149, 185
6859.12	151	8927	13	14077	3
6867.5	47, 49, 51	8928	189, 191	14412	89
6867.06	113	8932	3	14413	87
6868.14	13	8936	5	14436	5
6868.15	13	8945.11	75	14493	175
8197	27, 75	8945.21 15, 17, 23, 25, 27, 75,		14494	175
8256	3, 13	207		14495	175
8256.09	13	8945.60	75, 91, 97	14562	3, 5
8257.01	13	8946.2	229	14601	175
8351.01	3	8946.3	29, 75	14733	115
8352.01	3	8946.21	17, 29	14762.7	139
8352.05	3	8946.38	9, 23, 75	14762.8	135, 137, 225
8353.01	3	8946.41	75	16021	105, 113
8353.05	3	8946.51	19, 29	16181	5, 27, 29
8444	67, 75	9260	13	16391	5
8513W	3, 5	9392	67, 71	16499	115
8515.01	5	9393	87, 89	16704	47, 49, 51
8515.10	3	9394	71	17576	117
8516	11, 27, 33, 37, 43, 95	9395	71	17697	111
8517	105, 109, 113	9396	87, 89	17698	111, 185
8543	5, 67, 69, 71, 73	9398	89	17933	171
8547.03	113	9401	71, 85	17945	177
8547.04	113	9402	87	18024	67, 75
8775	69	9407	87	18404 ... 15, 17, 23, 25, 27, 75,	
8778	69	9409	71	207	
8779	69	9414	89	18405	15
8782	69	9415	71	18921	101, 103
8785	69	9417	71, 85, 89	19251	173
8790	69	9418	71, 85, 87	19430	119
8791	69	9467	3, 33, 35	19535MB	195
8792	69	9467.20	33, 45	19741	119, 121
8793	69	9469	107	19765	67, 73
8794	69	9589	119, 121	19782	51, 81, 163
8796.2	75	9780	177	19854	5, 47, 49
8796.8	91, 97	9781	177	20090	15
8796.33	91	9782	177	20373	33, 37, 43
8796.63	91	10198	121	20746	121
8797.6	91	10384.31	29, 75	20747	119, 121
8797.10	29, 75	10384.33	17, 19, 29, 75	30211	71
8797.27	91, 93	10384.40	9, 23	37048	201
8797.44	91	10384.49	213, 229, 239	37203	57
8797.56	17, 23, 75, 91	12207	5	37308	85
8797.92	213, 239	12207W	105	37309	85

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
37640	85	302558	59	303827	153
38713	5, 7, 55	302559	157, 159	303894	201
39185	9	302574	59	303895	17
51227	65	302605	157	303915	201
90161	175	302747	143	303916	201
90413	9, 93	302751	85, 179	303918	17, 19, 21, 23, 25, 207,
91925	139	302754	125, 127, 227	213, 229, 239	
150178	9, 93	302755	11, 33, 37, 43	303920	17, 19, 21, 23, 25, 207,
153803	17, 23, 153	302795	3	213, 229, 239	
200304	19, 21, 25, 207, 229	302845	7	303921	145
201048	75	302855	85	303925	145, 146
202074	11, 17, 19, 21, 23, 25,	302937	49	303930	145, 146, 147
27, 93, 207, 229		303044	123, 127	303938	3
202077	75	303046	193	303949	145, 146
202089	9, 93	303182	85	303950	145, 146
203199	179	303249	75, 91, 97	303951	145, 146
203835	9, 29	303339	55	303953	145, 146, 147
203843	9, 93	303340	55	303972	159
203844	9, 93	303341	55	303988	201
300282	17	303547	17, 19, 21, 23, 213,	304019	3
300294	229	229, 239		304047	125, 127, 227
300423	15	303659	167, 169, 171	304160	77, 79
300494	15	303662	171	304162	133
300512	13, 15	303675	153	304178	107
300512.4	15	303703	17, 23	304188	187, 189, 191
300512.8	15	303710	127	304191	187
300812	155	303711	127	304426	187
300813	155	303722	17, 19, 21, 23, 25, 31,	304445	33, 37, 43
300857	101	51, 207		304676	113
300858	129, 131	303724	17, 23, 25, 207	304705	145, 146, 147, 148
301097	144	303725	17, 23	304815	5
301098	143	303726	11, 17, 23, 27, 75	304860	149
301215	15	303732	141	304989	187
301232	139	303734	125, 127, 227	305213	161
301236	17, 19, 21, 23, 25, 213	303739	141	305216	103
301294.2	25, 207	303741	159	305258	35, 39, 45
301298	135, 137	303742	17, 19, 21, 23, 25, 207,	305259	63
301298-1	135	213, 229, 239		305260	63
301298-2	137	303748	153	305267	65
301299	139	303749	17, 23	305270	197
301434	19, 21	303769	17, 19, 21, 23, 25, 207,	305272	47
301556	19, 21, 25, 27, 207	213, 229, 239		305273	47
301662	81, 187	303773	17, 19, 21, 23, 25, 207,	305277	181
302140	197	213, 229, 239		305278	181
302214	119	303794	205	305280	57
302215	119	303795	205	305289	39, 45, 173
302257	119, 121, 123	303805	19, 21, 229	305301	179
302258	125, 127, 227	303809	201	305302	173
302446	15	303810	125, 127	305304	179
302466	19, 21	303814	145, 146, 147	305305	179
302557	157, 159	303826	153	305318	163

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
305319	55, 163	305593	91, 97	306387	51, 81
305321	165	305594	91, 97	306388	51, 81
305324	165	305596	91, 97	306389	146
305328	179	305597	91, 97	306391	146
305329	5, 39, 45, 55	305598	91, 97	306394	146
305332	55, 179	305599	55	306395	146
305345	41	305606	7	306399	146
305346	41	305609	7	306400	146
305355	173	305611	7, 85	306409	25, 207
305357	55, 173	305612	7, 85	306519	207
305360	165	305613	7, 85	306521	55
305361	165	305614	91	306644	25, 207
305362	165	305615	35, 39, 45, 55	306659	153
305365	181	305616	55	306764	153
305371	109	305617	55	306768	55
305374	167	305618	7, 55	306784	237
305375	105	305621	81	306785	237
305376	45	305622	7, 37, 39, 43, 45	306786	237
305380	183	305624	77, 79	306792	55
305382	169	305626	7, 51	306834	211
305383	59	305631	59	306835	211
305389	59	305644	19, 21	306837	211
305390	59	305695	169	306838	211
305391	59	305711	59	306839	211
305424	161	305712	9	306840	211
305448	7	305713	91	306864	197
305449 ...	7, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95	305732	55	306885	197
305450	23	305754	9, 93	306992	199
305451	9	305794	139	306993	199
305476	9	305813	247	307054	231, 233
305489	7, 9	306162	85	307055	209
305492	85	306286	125	307056	209, 231
305493	7	306287	127, 203	307120	207
305495	85	306292	125, 127	307122	153
305496	81	306293	125, 127	307123	207
305497	55, 81	306294	125, 127, 227	307124	207
305498	85	306295	203	307125	207, 213, 239
305499	7	306303	203	307127	207
305511	3, 7	306305	25	307131	207
305535	85	306307	239	307136	153
305538	91, 93, 97	306325	127	307150	207
305539	91, 93	306334	21	307278-1	209
305540	85	306344	195	307278-2	209
305541	91, 97	306347	25	307278-3	209
305542	91	306373	25, 207	307278-4	209
305576	85	306374	25, 207	307278-5	209
305577	85, 149	306377	25, 207	307278-6	209
305587	59	306379	25	307278-8	209
305588	19	306381	25	307278-14	209
305590	19	306385	25	307278-15	209
		306386	51, 81	307278-16	209

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
307278-17	209	309632	229	F100331	67
307294	209	309634	229, 235	F100360	153
307295	117	309713	103	F100671	39, 45, 163
307306	229, 231	309714	103	F100708	59
307355	3	309735	148	F101360	209
307377	229, 231, 233, 235	309736	148	F101603	7
307393	213, 215, 217	309737	148	F103925	207
307498	213	309738	148	F104232	159
307521	223	309739	148	F104276	103
307522	223	309740	148	M562-A54	113
307523	227	309741	148	M562A181	55
307524	227	309928	244	M8945.21	27
307528	213, 239	309940	246	NW032281	19, 21, 229
307538	225	309941	246	NW032845	9, 93
307543	227	309946	9, 27, 95	NW034240	144
307583	229	309947	11, 29, 95	NW034716	59
307621	79	309950	11, 29, 95	NW35615	65
308649	149	309955	27, 95	NW35809	213, 239
308650	149	309956	201	NW35842	65
308703	219, 221, 239, 241	309957	29	NW35843	65
308708	239	309961	77, 201	NW036518	9, 91, 93
308711	229	309970	185	NW036560	91
308713	233	309980	47	RF090877	195
308910	51	309982	242, 243, 244, 245, 246	RF090879	195
308911	51	309988	35, 39, 45, 117	RF090894	195
308953	245	309993	213, 219, 221	RF090895	195
308954	245	309995	213	SB502	47, 49, 51, 77, 133, 137, 139, 163, 213, 239
308955	245	310002	242		
308970	219, 221, 241	310016	47		
308971	241	310050	129, 131		
308972	219, 221, 241	419401	207		
308973	241	419402	207		
308974	219, 221, 241	F002465	9		
308975	219, 221, 241	F006612	51		
308976	241	F009535	91, 97, 153, 211		
308977	241	F9536	153, 209		
309009	229	F9546	153		
309016	213	F9549	153		
309061	213, 217	F009665	67		
309144	213	F009792	157, 159		
309165	147	F013588	91, 97, 227, 246		
309167	147	F015922	67		
309173	147	F016765	67		
309174	147	F017264	153, 209, 227		
309175	147	F017385	27, 75		
309177	147	F018975	246		
309182	237	F100062	209, 215, 217, 231, 235		
309500	243, 244	F100302	91, 97		
309501	243, 244	F100304	209		
309516	213, 219	F100312	209, 215, 231		
309628	213				

SECTION 4 ILLUSTRATED PARTS LIST

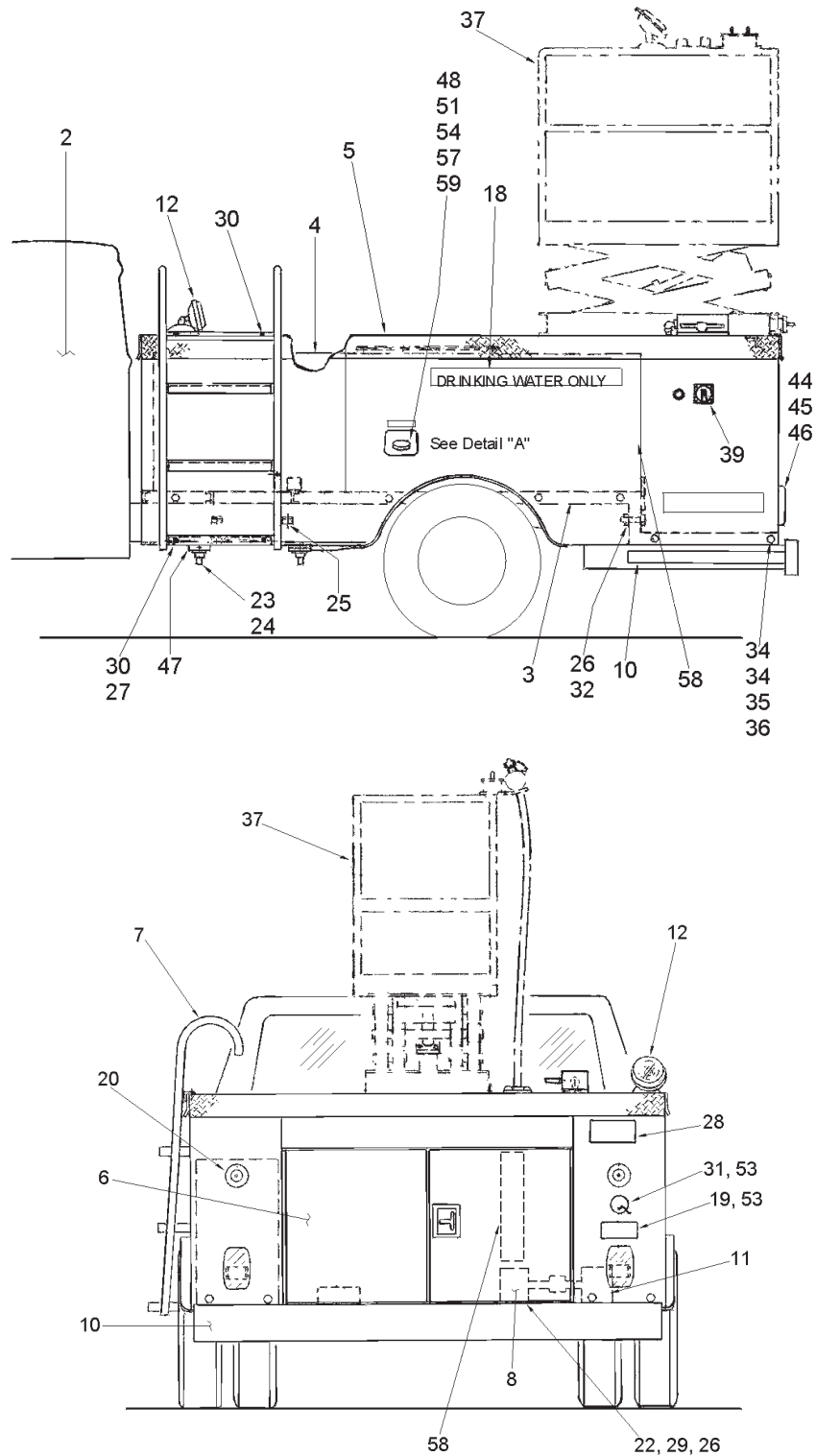


FIGURE 1.
WATER TRUCK ASSEMBLY WITH REAR COMPARTMENT DOORS
1 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
1-	8513W		Water Truck Assembly with Rear Compartment Doors, 1 of 2		Ref
2	8256		Truck Preparation		1
3	303938		Tank Support Frame	B	1
	8932		Tank Support Frame	A	1
	305511		Frame Weldmt, Tank Support (w/Lift Option)		Ref
	Comm		(assembly parts below not shown)		2
	Comm		HHCS, 1/2-13 x 3.50		2
	Comm		Washer, Flat, 1/2		2
	Comm		Nut, Lock, 1/3-13		4
	Comm		HHCS, 5/8 x 0.75		4
	14562		Washer, Lock, 5/8		2
	3.0305		Clamp, Chassis		6
	3.0391		Washer, Flat, 5/8		6
			Nut, Lock, 5/8-11		
4	1308		Water Tank Assy (assy parts below not shown)		1
	Comm		HHCS, 5/8-18 x 0.75		1
	3.0654		Plug, Pipe, SST, 2" IPS		2
	307355		Cover, Tank		1
	9.0077		Gasket		1
	Comm		RHMS, SST, #10-24 x 5/8"		12
	Comm		Nut, Hex, SST #10-24		12
	304019		Plate, Arc		1
5	14077		Tank Cover Assy (assembly parts below not shown)		1
	302795		Cover, Heat Option Cutout		1
	Comm		Insulation, Styrofoam, 2" x 130 sq. ft.		1
	1310.45		Coverplate, Tank Cover		1
	Comm		Screw, Hex, Self-Tap, 1/4 x 0.75		12
	1649		Guide Assembly, Hose		1
	Comm		RHMS, 1/4-20 x 3.50		4
	Comm		Nut, Lock, 1/4-20		4
6	8351.01		Door Assembly		1
6A	8352.01		Door, Rear Compartment, Left		1
6B	8352.05		Door, Rear Compartment, Right		1
6C	8353.01		Lock Assembly, Rear Door		1
	1.7235		Receptacle		1
	8353.05		Rod		1
7	8515.10		Ladder, Access		1
8	9467		Water Plumbing (See Figure 13)		1

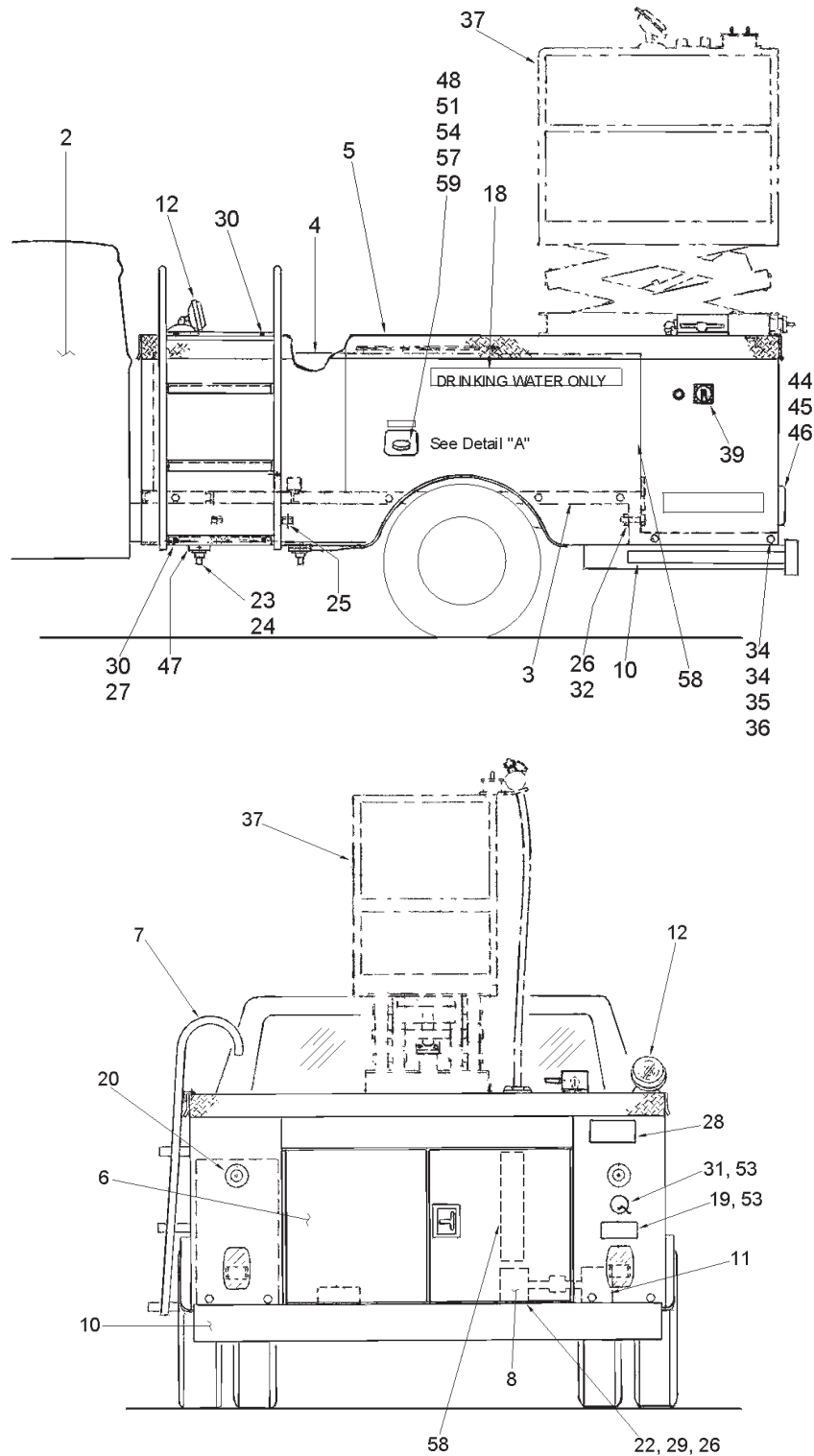
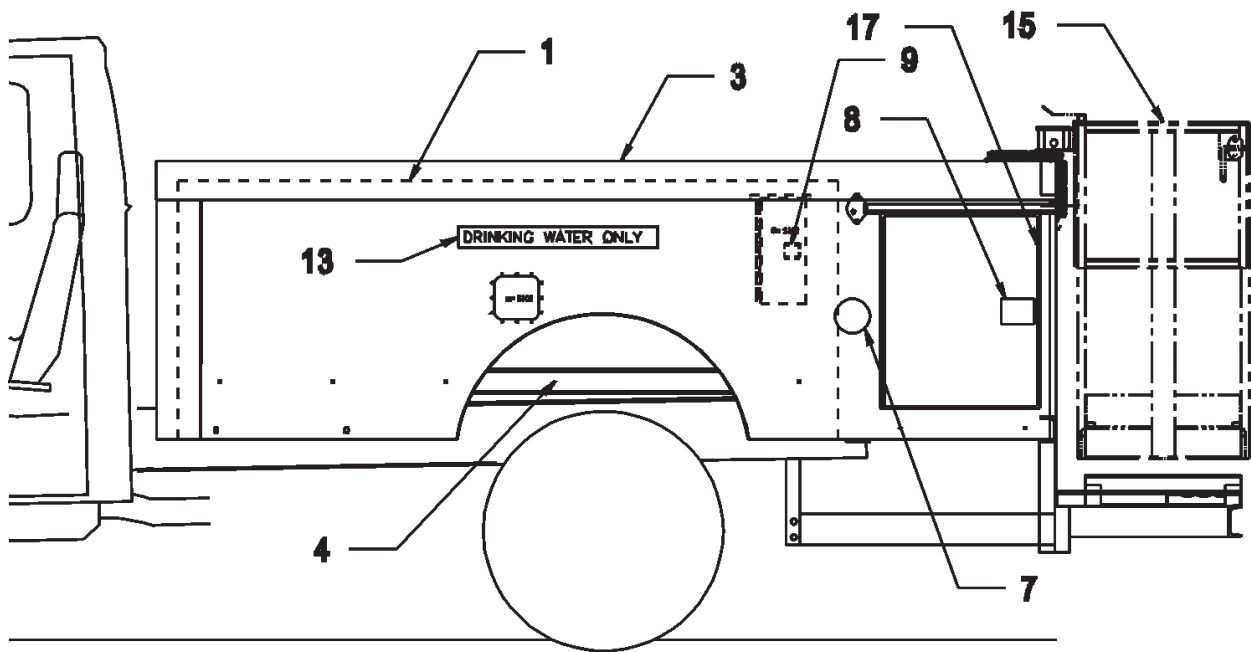


FIGURE 1.
WATER TRUCK ASSEMBLY WITH REAR COMPARTMENT DOORS
2 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
1-	8513W		Water Truck Assembly with Rear Compartment Doors, 2 of 2		Ref
10	8515.01		Bumper, Rear		Ref
	304815		Bumper, Rear Bolted		1
	13657		Optional, Bumper w/Flip-up Door		
11	16181		Hydraulic System (See Figure 11)		1
12	2.0435	538-000-CHR	Light, Swivel Spot, 12V/30W (46576)		Ref
18	2237		Placard, W-14 Drinking Water Only		2
19	562A546		Placard, Serial #		1
20	1.0166		Bumper, Door		2
22	8936		Washer, Mounting		8
23	Comm		Washer, Flat, 5/8		6
24	Comm		Nut, Lock, 5/8-11		6
25	Comm		Nut, Lock, 3/8-16 (w/Flat Washer)		4
26	Comm		Nut, Lock, 1/2-13		10
27	Comm		Nut, Lock, 3/8-24		2
28	562A282		Placard, Tank Fill Instructions		1
29	Comm		HHCS, 1/2-13 x 1.00		8
30	Comm		HHCS, 3/8-24 x 1.00 (w/Lock Washer)		4
32	Comm		HHCS, 1/2-13 x 3.50 (w/Flat Washer)		2
33	Comm		HHCS, 3/8-16 x 1.00		18
34	Comm		Nut, Hex, 3/8-16		18
35	Comm		Washer, Flat, 3/8		18
36	Comm		Washer, Lock, 3/8		18
37	8543		Lift Option (See Figure 27)		Ref
39	12207		Heat Option		Ref
40	3.1084	Comm	Clamp, Hose		4
41	3.1086	Comm	Clamp, Hose		6
44	14436		Bracket, Tail Light Clamp	A	2
45	Comm		Nut, Lock, 1/4-20		4
46	Comm		Washer, Flat, 1/4		4
47	14562		Clamp, Chassis		4
48	1.8318	Comm	Hose, Flexible Fuel	A	45"
50	2.3478	Comm	Flex Guard		36"
51	9.2009	Comm	Hose, Fuel	A	45"
52	38713		Decal, Wollard		2
53	Comm		Pop Rivet, #4-4		4
54	1.8623	Comm	Clamp, Crimp (inner hose)	A	1
55	19854		Electrical Assembly (See Figure 18)		1
57	3.1090		Clamp, 1-9/16"	A	1
58	305329		Decal, Water Level		1
59	16391		Protect-O Gas Cap, Option		1



30548

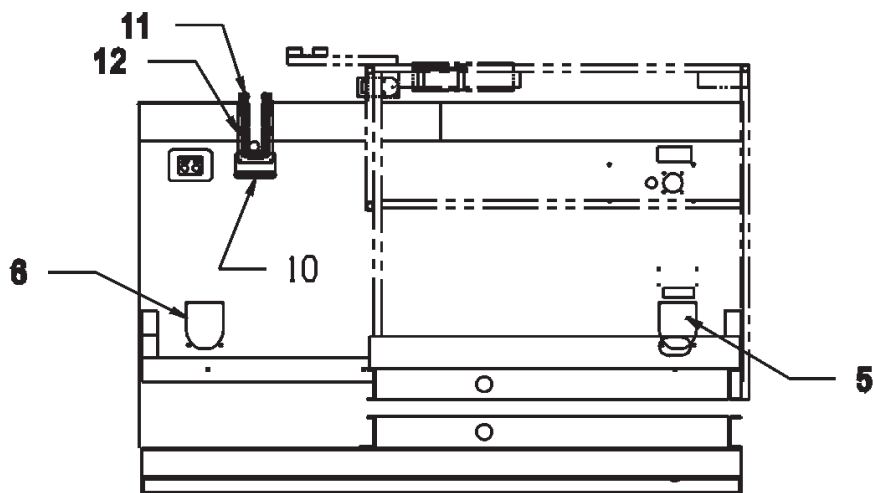


FIGURE 2
WATER TRUCK ASSY W/SIDE COMPARTMENT DOORS

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
2-	305448		Water Truck Assembly with Side Compartment Doors		Ref
1	1308		Tank Weldment, Drinking Water		1
3	305606		Cover Assy, Tank, SS, 402		1
4	305511		Frame Weldment, Tank Support, SS, 402		1
7	1.0166		Bumper, Rnd Doughnut, 3.25 Dia.		3
8	305499		Latch, Door, Slam Action, 402		2
9	305493		Latch, Door, Slam Action, 402		1
10	305611		Guide Roller Weldment, Inner, 402		1
11	305612		Guide Roller Weldment, Upper, 402		1
12	305613		Guide Roller Weldment, Lower, 402		1
13	2237		Placard, W-14 Drinking Water		Ref
15	305449		Lift Option (See fig 28)		Ref
17	F101603		Trim		72"
NS	305489		Hyd Assy, 402 (See fig 3)		1
NS	305609		Out Service, Spray Insulation		1
NS	305622		Plumbing Assy, 402 (See fig. 14)		1
NS	305626		Elec Assy, 402 (See fig 19)		1
NS	305618		Placard Assembly (See fig 21)		1
NS	38713		Decal, Wollard, Black		2
NS	302845		Cover, Tailight Openint		2

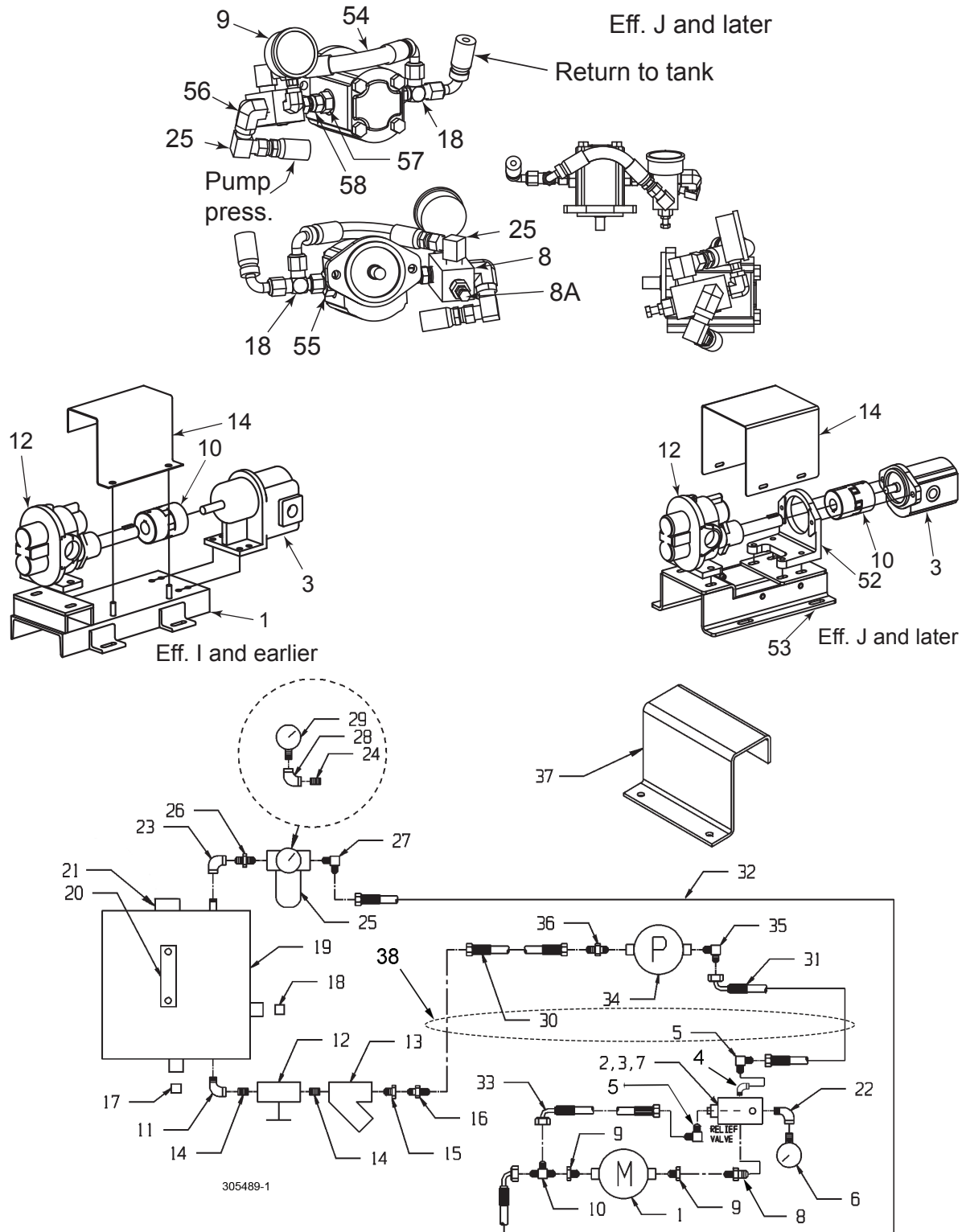


FIGURE 3.
HYDRAULIC INST. W/ SIDE COMPARTMENT DOORS AND W/O LIFT

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
3-	305489		Hydraulic Inst. w/ Side Comp. Doors & w/o Lift		Ref
1	1.4193		Motor, Hyd.		1
	309946		Motor, Hyd, 1.61 CIR 5/8 Key, CCW	J	1
2	1.8450		Cartridge, Valve Relief, 100-3000		1
3	1.8453		Manifold, Relief, 1/2" NPT		1
4	90413		Ftg, Hyd, 08MJ-08MB		1
	3.1413		Ftg, Hyd, 08MP-08FP90	I	1
5	3.1380		Ftg, Hyd, Ell, 08MJ-08MB90		1
	3.1566		Ftg, Hyd, Ell, 08MJ-08MP90		2
6	1.0474		Gauge, Oil Pressure, 0-3000 PSI	I	1
7	3.2752		Plug, Socket Head, 1/4 NPT		1
8	1.8608		Ftg, Hyd, Ell, 08MB-08FP90		1
	3.1416		Ftg, Hyd, Ell, 08MP-08MP	I	1
9	3.0241		Ftg, Hyd, 12MP-08FP		2
10	3.2172		Ftg, Hyd, Tee, 08MJ-08MP-08MJ		1
11	203843		Ftg, Hyd, Ell, 1-1/2 BMI M/F		1
12	1.0890		Valve, Gate, 1-1/2 NPT, Brass		1
13	1.3368		Strainer, Y, 1-1/2 NPT, 100 Mesh		1
14	NW032845		Ftg, Pipe, N, 24MP-24MP, SCH40		2
15	3.0566		Reducer, 1-1/2 x 1-1/4, Brass		1
16	203844		Ftg, Hyd, 16MJ-20MP		1
17	1.7162		Plug, Magnetic MDP		1
	39185		Plug, Magnetic MDP	I	1
18	F002465		Plug, Pipe, 1" NPT, Blk		1
19	305476		Tank Weldment, Hyd, 402		1
20	305712		Gauge, Sight, 3/8 NPT		1
21	305451		Fill Unit, Side Mount, w/ Strainer		1
22	3.0248		Ftg, Hyd, Ell, 04MP-04FP90		1
23	3.0593		Ftg, Pipe, Ell, 12FP-12FP90		1
24	NW036518		Ftg, Pipe, N 02MP-Close		1
25	1.0437		Filter, Hyd, Return, 3/4" NPT		1
26	150178		Ftg, Pipe, N, 12MP-12MP-2.5, STL		1
27	3.1568		Ftg, Hyd, Ell, 08MJ-12MP90		1
28	305754		Ftg, Hyd, Ell, 02FP-02FP90		1
29	1.9008		Gauge, Indicator, 0-30 PSI, 2"	I	1
30	10384.40		Hose Assy, 16L x 236.00, ST/ST		1
	Ref		Hose Assy, Suction (chassis-dependent)	I	Ref
31	8946.38		Hose Assy, #8M, 237.7", A		1
	Ref		Hose Assy, Pressure (chassis-dependent)	I	Ref
32	202089		Hose Assy, #8 M, 21.00", ST/90	I	1
33	203835		Hose Assy, #8 M, 9.5", ST/EL 90	I	1

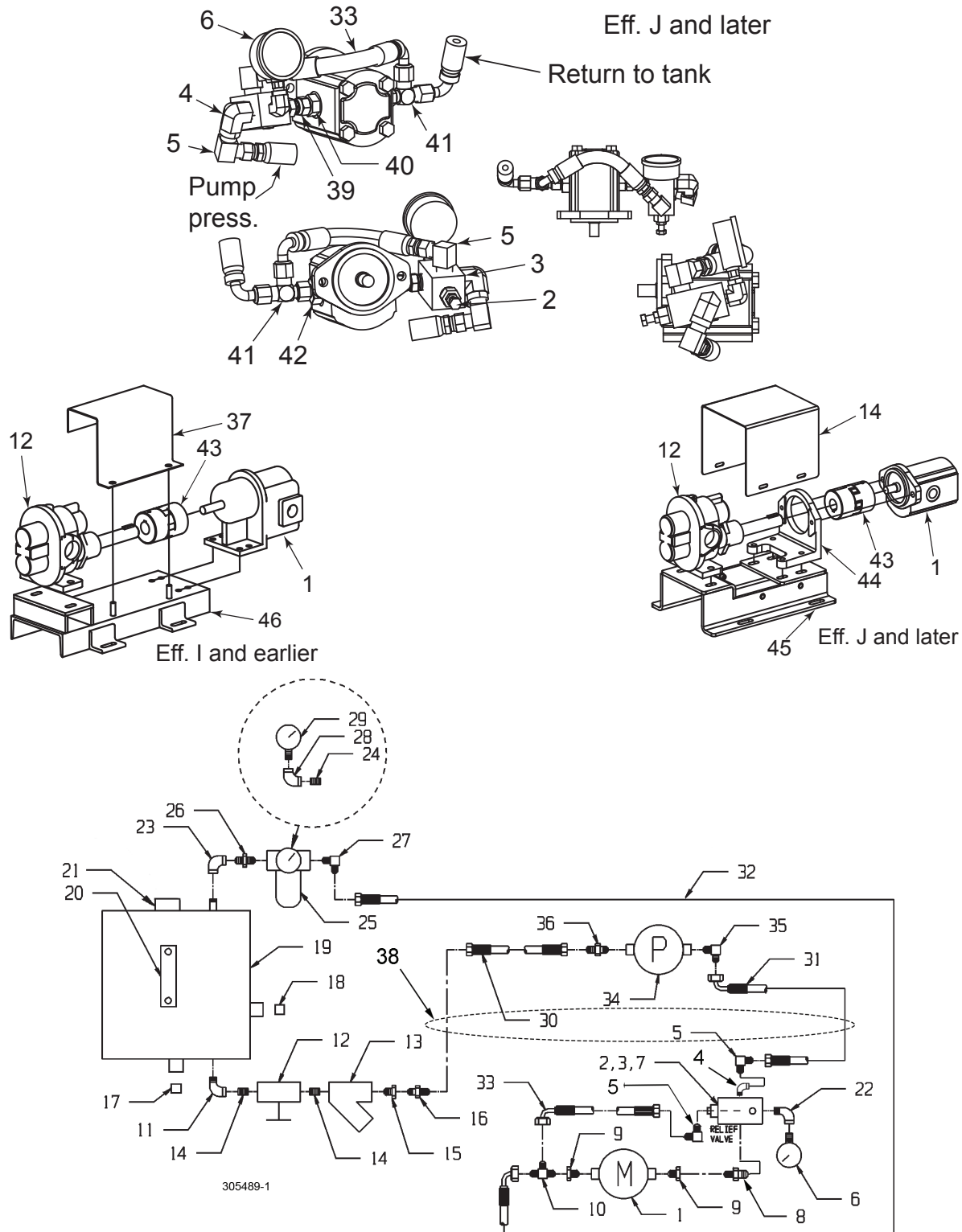


Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
34	303726		Pump, Hyd, Danfoss, Side, Parts .77		Ref
	Ref		Pump, Hyd, (Chassis-dependent)	I	Ref
35	202074		Ftg, Hyd, Ell, 08MJ-10MB45		Ref
	Ref		Ftg, Hyd, (chassis dependent)	I	Ref
36	3.2875		Ftg, Hyd, 16MJ-12MB		Ref
	Ref		Ftg, Hyd, (chassis dependent)	I	Ref
37	302755		Shaft Guard (See Fig 13, 14, 15)		1
38	8.0156		Trim, Edge, Door, Chrome	I	15"
39	309957		Ftg, Hyd, 08MP-08FJX	J	1
40	3.2703		Ftg, Hyd, 08MJ-10MB	J	1
41	3.2679		Ftg, Hyd, Tee, 08MJ-08FJX-08MJ	J	1
42	3.2961		Ftg, Hyd,, 08MJ-12MB	J	1
43	1.2189		Coupling, 1 x 5/8, w/ Spider, L100	J	1
44	309947		Mount, Pump	J	1
45	309950		Base Assy, Pump Drive	J	1
46	8516		Base Weldmnt, Motpr/Pump		1
NS	3.1081		Clamps, Loop Type 2"		4

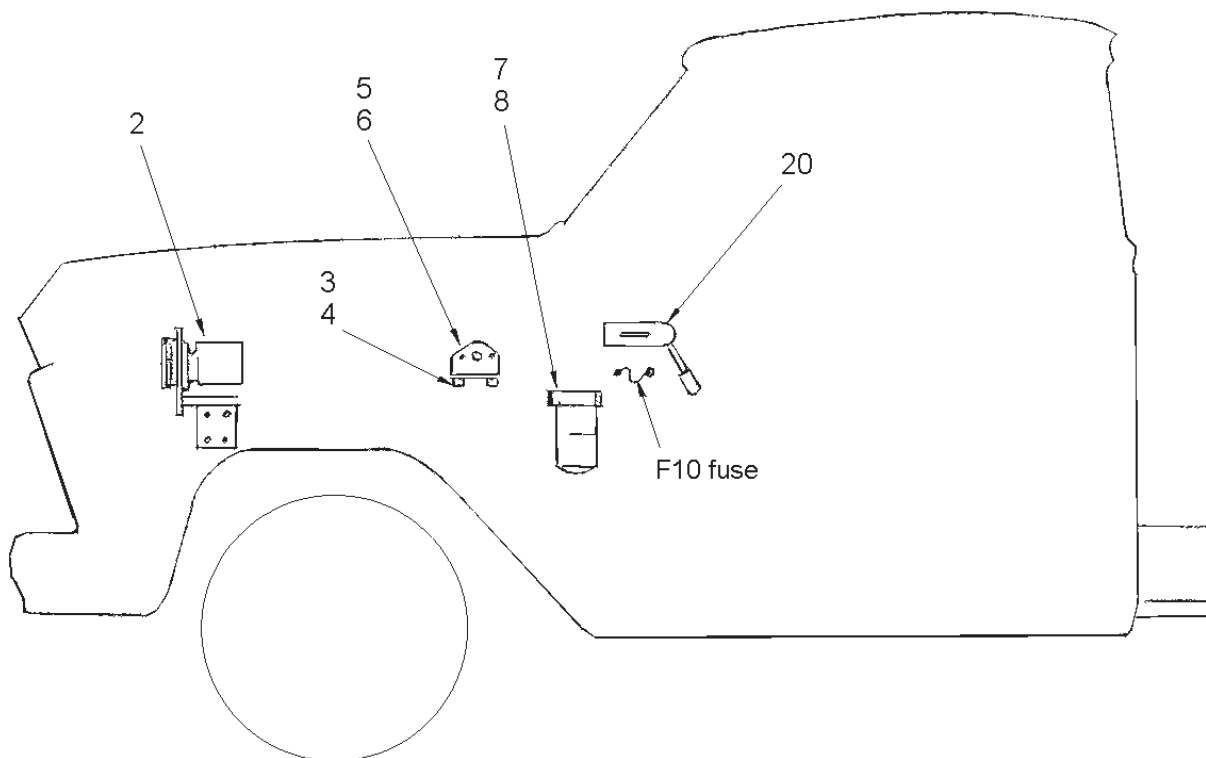
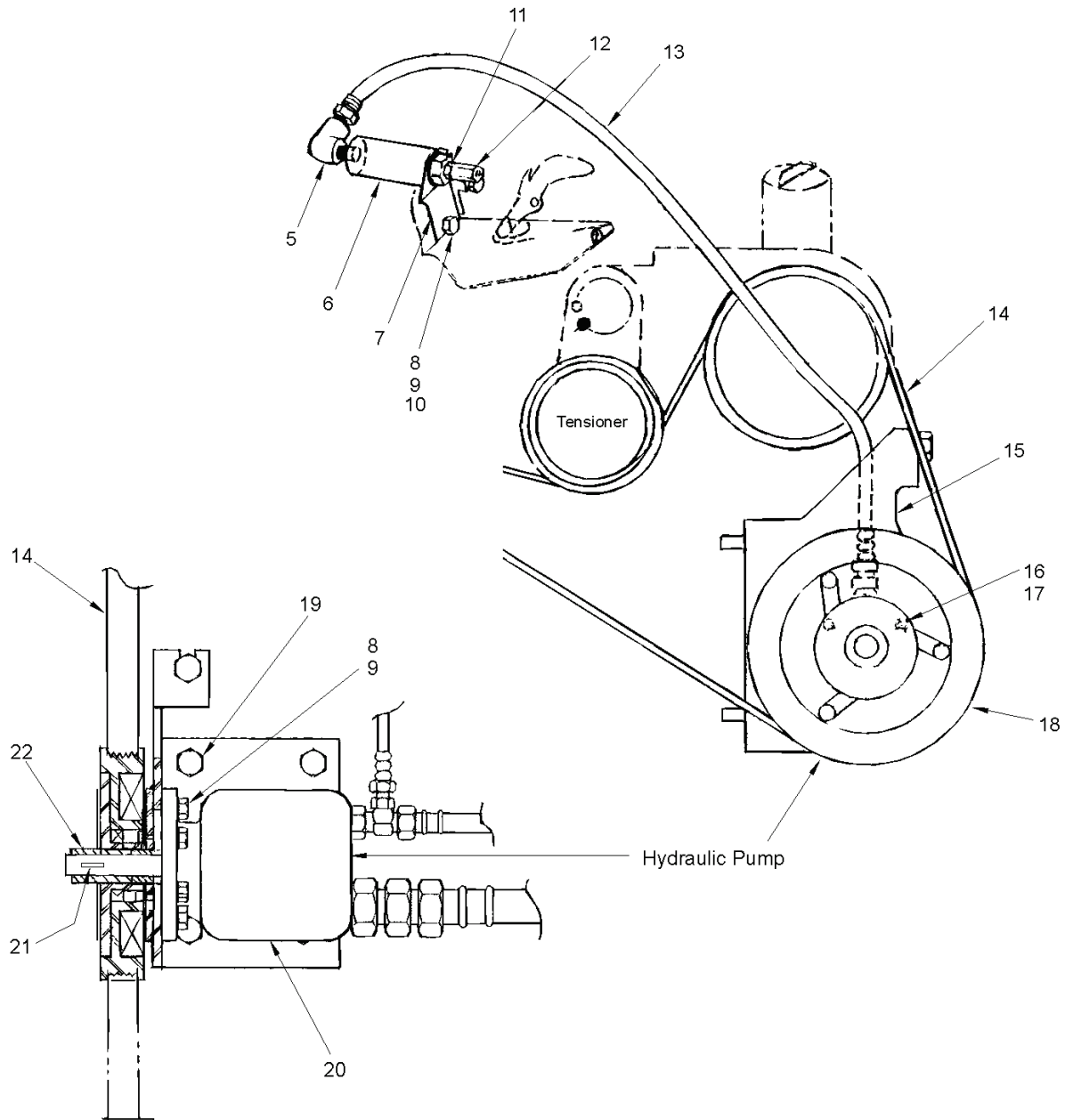


FIGURE 4.
PREPARATION, TRUCK 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
4-	8256		Preparation, Truck, 96/97 A	A	Ref
2	300512		Engine Preparation (See Figure 5)		Ref
3	6868.15		Spacer		4
4	Comm		HHCS, 1/4-20 x 1.75 (with lock nut)		4
5	6868.14		Bracket, Solenoid		1
6	Comm		HHCS, 3/8-16 x 0.75		2
7	8257.01		Bracket, Filter		1
8	Comm		HHCS, 5/16 x 0.75		3
9	8256.09		Plate (Not shown, welded to frame ends)		2
11	9.0884	Comm	Hose, Fuel, 3/8" ID (not shown)		24"
13	9260		Bracket, Terminal Mounting (in engine compartment)		1
20	8927		Parking Brake Option		Ref
22	Comm		Washer, Flat, 3/8 ID x 7/8 OD (located on muffler hangers)		8



**FIGURE 5.
PREPARATION, ENGINE 96/97**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
5-	300512		Preparation, Engine, 96/97	A	Ref
5	3.1940	2024-6	Elbow (01276)		Ref
6	18404	D-01792	Cylinder, Throttle Advance (50405)		1
7	300423		Bracket, Cylinder		1
8	Comm		HHCS, 3/8-24 x 7/8		6
9	Comm		Washer, Lock, 3/8		6
10	Comm		Nut, 3/8-24 NF		1
11	Comm		Nut, Jam, 1/4-28		2
12	18405		Striker		1
13	8945.21		Hose Assy, Type "A", 3/8 x 30"		Ref
14	300494	K061033	Belt, Drive (Sams)		1
	302446	K081189	Belt, Drive, 8-Rib (Sams) (for diesel)		Ref
15	20090		Bracket, Pump Mounting		1
16	Comm		Screw, Fil. Hd, 1/14-28 x 3/8		3
17	Comm		Washer, Flat, 1/4		3
18	301215	28AS02/13850	Clutch, Magnetic (34398)		1
19	3.3191	Comm	HHCS, M8 x 1.25mm x 40mm		2
20	1.0664	HD1515-C1-C11 SK0362	Pump, Hydraulic (02892)		1
	1.3362		Seal Kit, Pump		Ref
21	300512.4		Key, Pump Shaft, 3/16 x 3/16 x 1.25		1
22	300512.8		Spacer, Pump Shaft To Clutch		1
NS	3.3051		Coupling		1

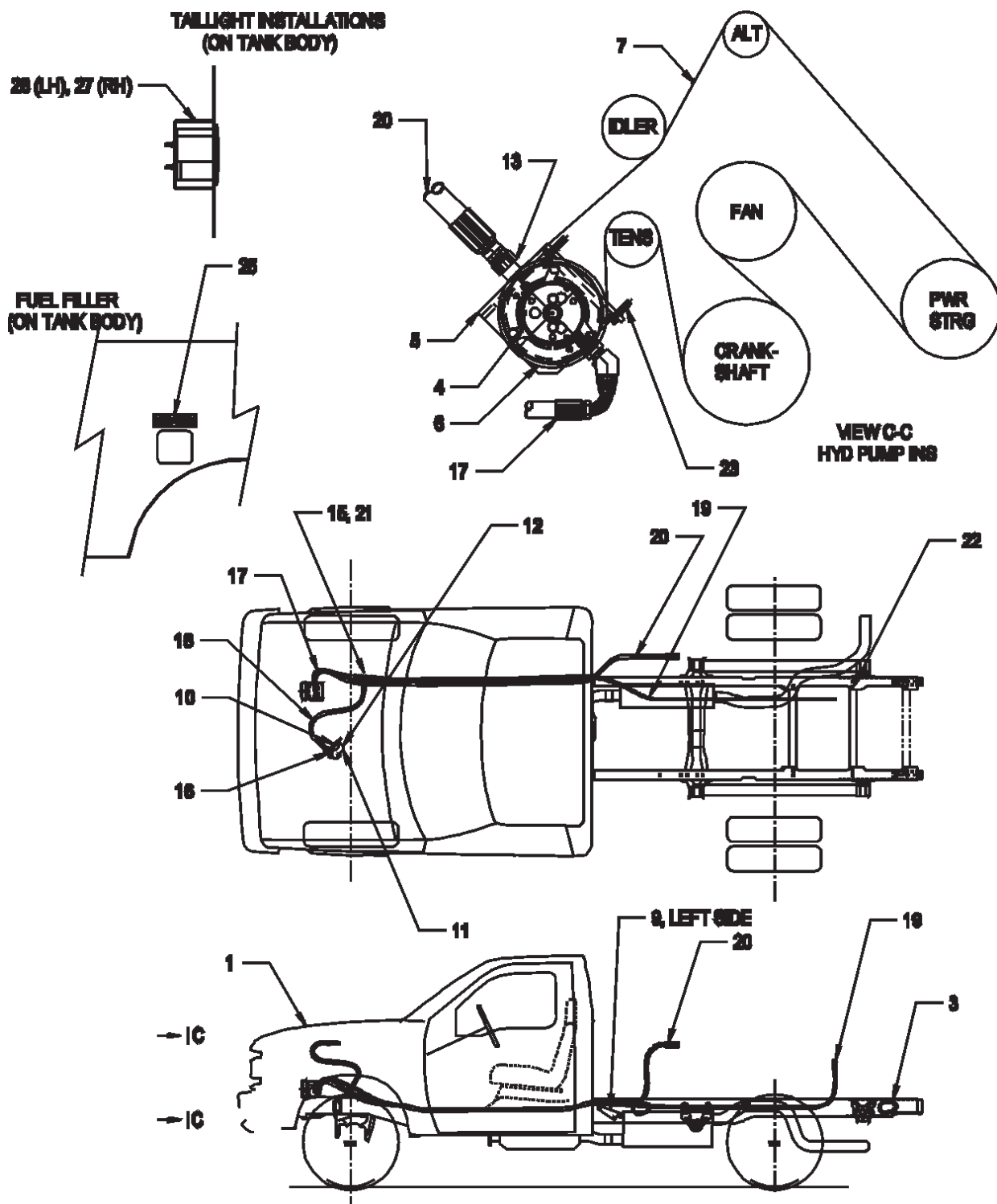
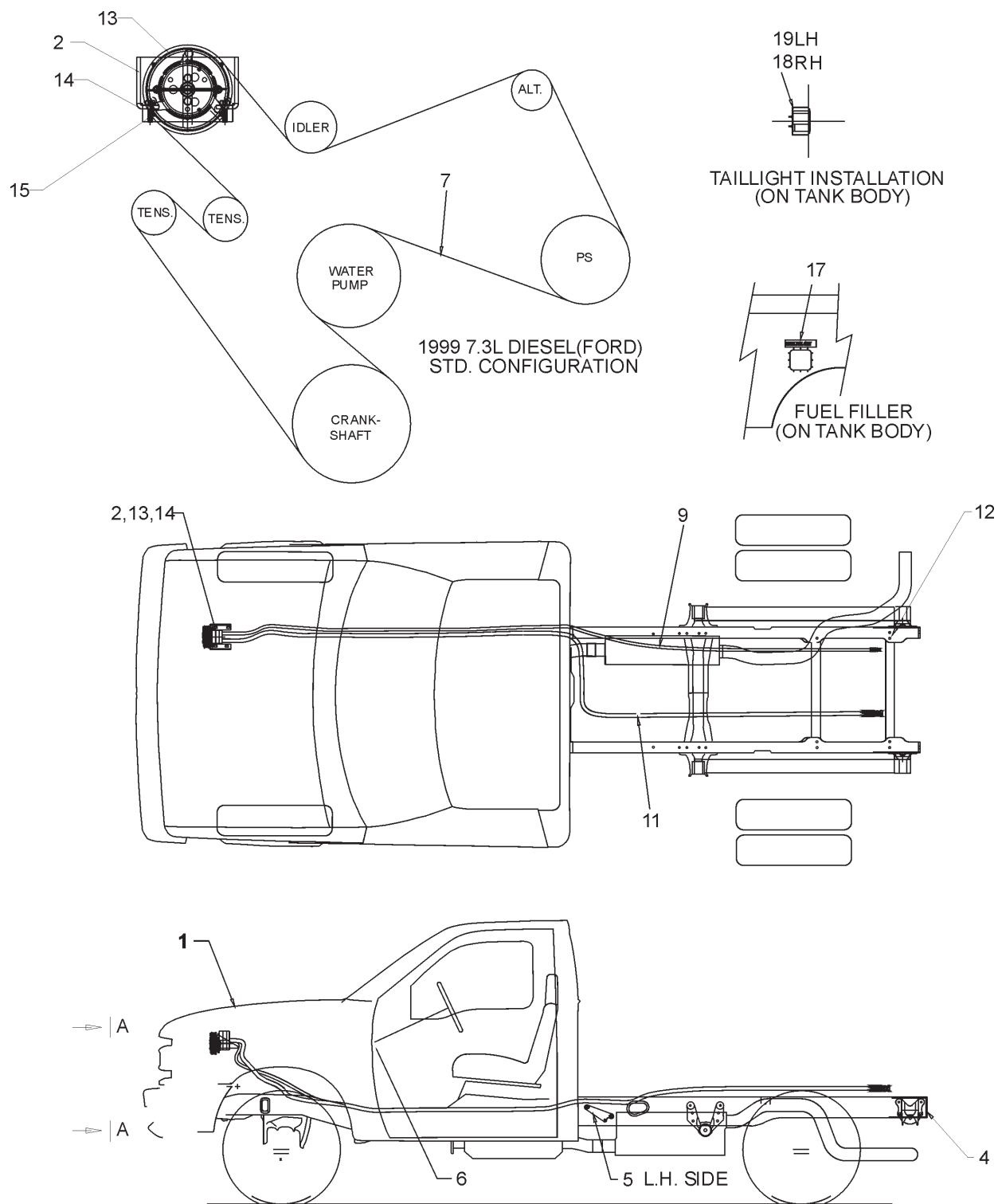


FIGURE 6
TRUCK PREP, F350 GAS, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
6-	303895		Truck Prep, F350 Gas, 99 & Later	B	Ref
1	300282		Truck Chassis, F350, V10 Gas		1
2	303547		Out-of-Service, Alignment, F350		1
3	303920		Plate, Rear Frame Mtg		2
4	303726		Hyd Pump, Danfoss, Side Ports		1
5	303724		Brkt Wldmnt, Hyd Pump		1
6	303722		Clutch, Mag, 8-Groove		1
7	303725		Belt, 8-Groove, K081020		1
8	303749		Tensioner, Drive Belt		1
9	303918		Nut-Plate Wldmnt, LH Front Mtg		1
10	18404		Cyl, Throttle Advance		1
11	303703		Brkt, Cyl Mtg, Throttle Advance		1
12	3.3051		Nut, Coupling, 1/4-28		1
13	3.2875		Ftg, Hyd, 16MJ-12MB		1
14	202074		Ftg, Hyd, 45°, 08MJ-10MB45		1
15	3.1840		Ftg, Hyd, Tee, 08MJ-08MJ-08MJ		1
16	3.1940		Ftg, Hyd, 90°, 06MJ-02MP90		1
17	8797.56		Hose Assy., #8 x 22.1" St/EI		1
18	8945.21		Hose Assy., #6 x 32.6" St/EI		1
19	8946.21		Hose Assy., #8 x 216.0 St/EI		1
20	10384.33		Hose Assy., #16 x 180" St/EI		1
21	3.2884		Ftg, Hyd, 08FJ-06MJ		1
22	303769		HHCS 3/8-16 x 1/5LG, Gr 8		8
23	153803		HHCS M8 x 1.25 x 25mm		3
24	301236		Manual, TWS402 (Install per 305717)		1
25	562A279		Decal, Gasoline Only		1
26	303742		Bracket, Taillight, RH		1
27	303773		Bracket, Taillight, LH		1



**FIGURE 7.
TRUCK PREP, F350 DIESEL, 99 & LATER**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
7-	305590		Truck Prep, F350 Diesel, 99 & Later	B,G	Ref
0	305588		F350, Diesel, TWS 402, Opt.		Ref
1	302466		Truck Chassis, F350 Diesel		Ref
2	301434		Adapter Weldment, Pump		1
4	303920		Plate, Rear Frame Mnt		2
5	303918		Nut-Plate Wldmnt, LH Front Mtg.		1
6	303805		Cover, Control Mod, Throttle Ad		1
7	305644		Belt, 8 Groove, F350, Diesel		Ref
8	202074		Ftg, Hyd, El, 08MJ-10MB45		1
9	8946.51		Hose Assembly, 216"		1
10	200304		Ftg, Hyd, 12MB-16MJ45		1
11	10384.33		Hose Assembly		1
12	303769		HHCS, 3/8-16 X 1.5, GR 8		8
13	303722		Clutch, MAG, 8-Groove		1
14	301556		Pump, Hyd, .77 CI		1
15	NW032281		HHCS, M8 X 30MM		4
17	560A89		Decal, Diesel Fuel Only		1
18	303742		Bracket, Taillight, RH		1
19	303773		Bracket, Taillight, LH		1
NS	301236		Manual, TWS402 (Install per 305717)		1
NS	303547		Out Service, Alignment, F350		1

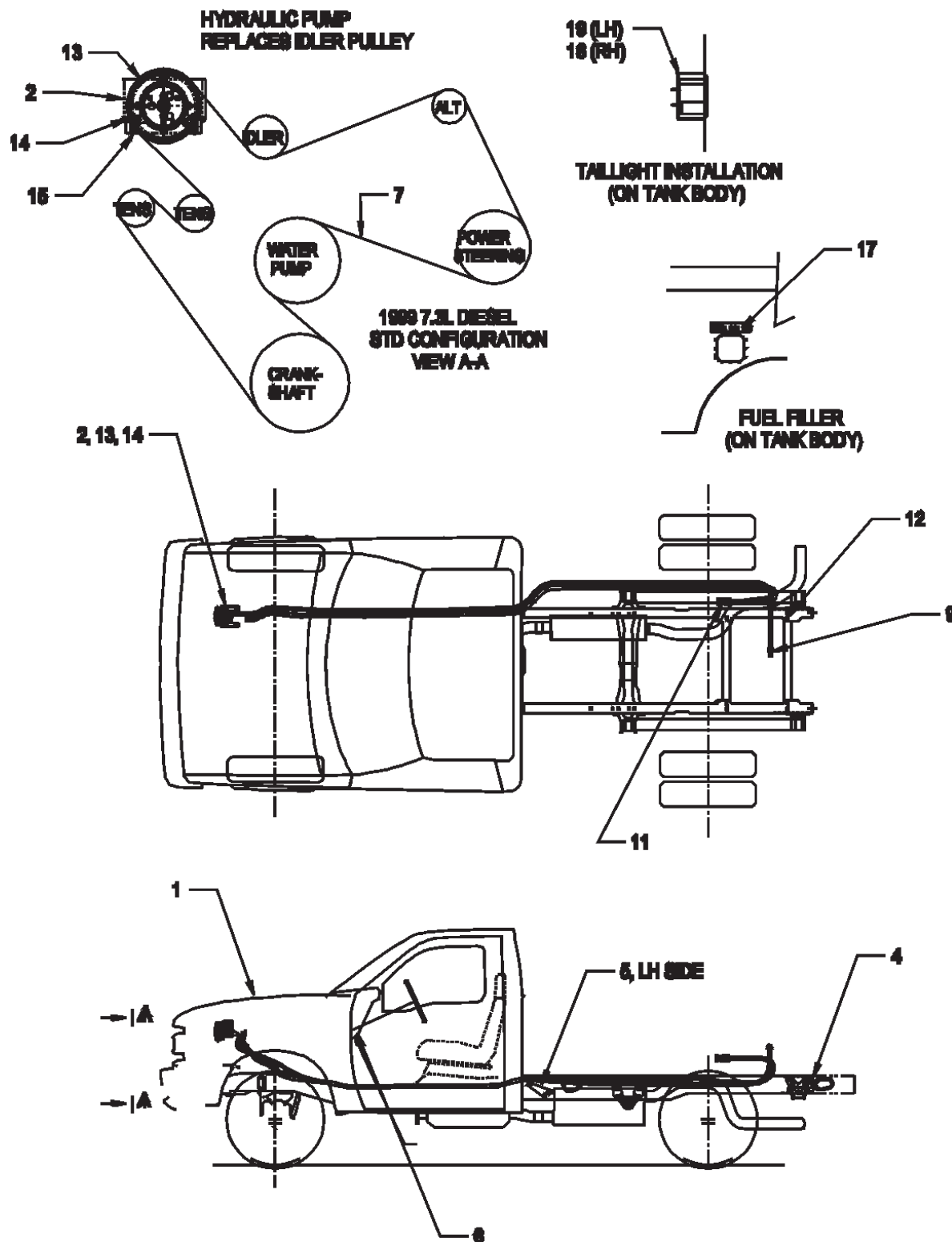


Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
8-	306334		Truck Prep, F350, 99 & Later		Ref
1	302466		Truck Chassis, F350, Diesel		Ref
2	301434		Adapter Weldment, Pump		1
4	303920		Plate, Rear Frame Mount, 402		2
5	303918		Nut Plate Weldment, LH Front Mounting		1
6	303805		Cover, Control, Mod, Throttle Adv		1
7	305644		Belt, 8 Groove, F350 Diesel		Ref
8	202074		Ftg, Hyd, Ell, 08MJ-10MB45		1
9			Hose Assembly, #8M		1
10	200304		Ftg, Hyd, Ell, 16MJ-12MB45		1
11			Hose Assembly, #16L		1
12	303769		HHCS 3/8-16 x 1.5, GR8		8
13	303722		Clutch, Mag, 8 Groove		1
14	301556		Pump, Hyd, .77 CI		1
15	NW032281		HHCS M8 x 1.25 x 30MM		4
17	560A89		Decal, Diesel Fuel Only		1
18	303742		Bracket, Taillight, RH		1
19	303773		Bracket, Taillight, LH		1
NS	303547		Out Service, Alignment, F350		1
NS	301236		Manual, TWS402 (Install per 305717)		1

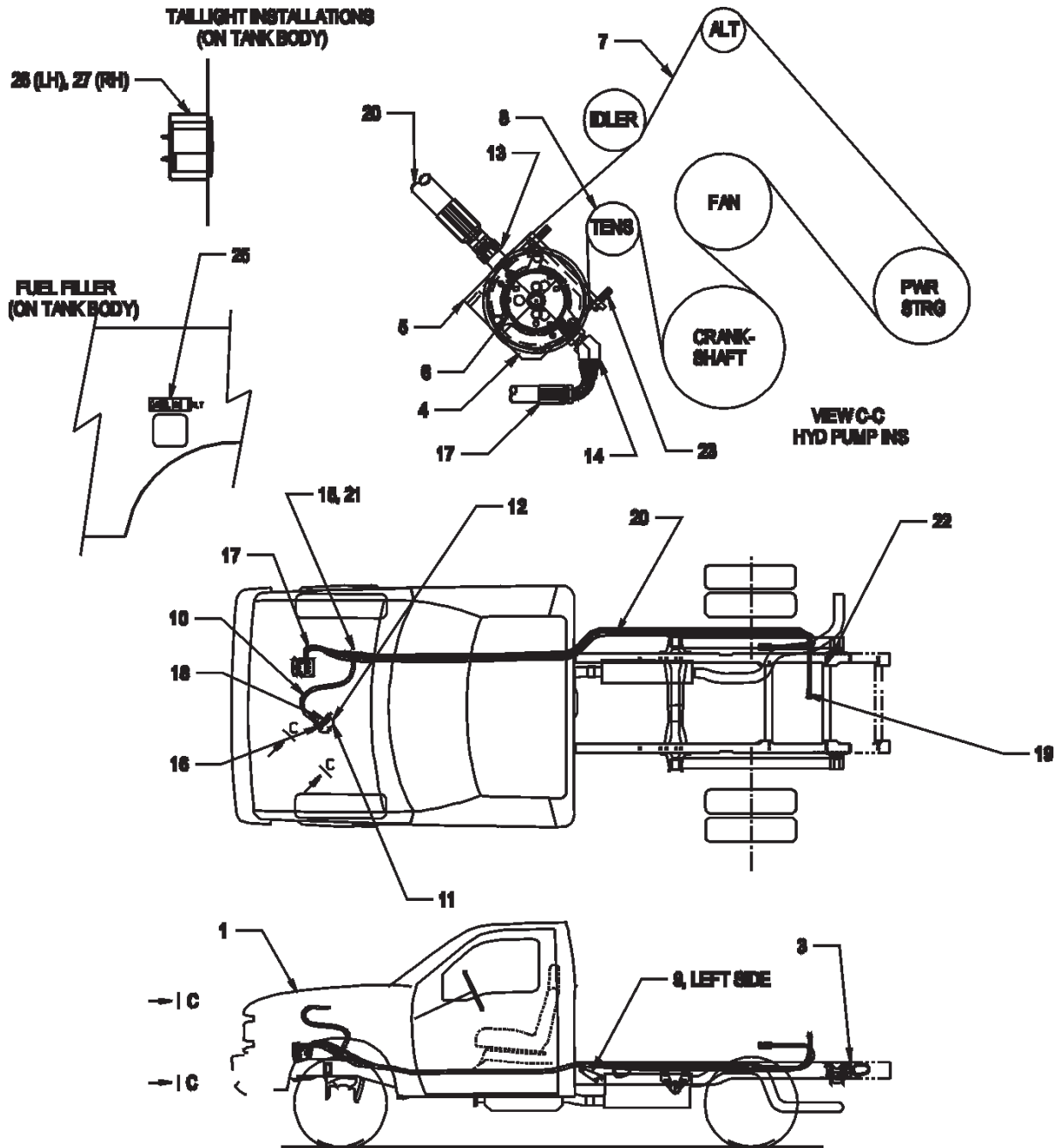


FIGURE 9
TRUCK PREP, F350 V10 GAS, 99 TO 01

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
9-	305450		Truck Prep, F350 V10 Gas, 99 to 01		Ref
1			Truck Chassis, F350, V10 Gas		Ref
3	303920		Plate, Rear Frame Mounting		2
4	303726		Hydraulic Pump, Danfoss, Side Ports		1
5	303724		Bracket Weldment, Hydraulic Pump		1
6	303722		Clutch, Mag, 8 Groove		1
7	303725	K081020	Belt, 8 Groove		1
8	303749		Tensioner, Drive Belt		1
9	303918		Nut, Plate Weldment, LH Front Mounting		1
10	18404		Cylinder, Throttle Advance		1
11	303703		Bracket, Cycle Mounting, Throttle Advance		1
12	3.3051		Nut, Coupling, 1/4-28		1
13	3.2875		Ftg, Hyd, 16MJ-12MB		1
14	202074		Ftg, Hyd, 45 08MJ-10MB45		1
15	3.1840		Ftg, Hyd, Tee, 08MJ-08MJ-08MJ		1
16	3.1940		Ftg, Hyd, 90, 06MJ-02MP90		1
17	8797.56		Hose Assembly, #8 x 22.08" ST/90		1
18	8945.21		Hose Assembly, #6 x 32.64" ST/ST		1
19	8946.38		Hose Assembly, #8 x 237.72" ST/ST		1
20	10384.40		Hose Assembly, #16 x 236.00" ST/ST		1
21	3.2884		Ftg, Hyd, 08FJ-06MJ		1
22	303769		HHCS 3/8-16 x 1.5LG, GR8		8
23	153803		HHCS M8 x 1.25 x 25mm		3
25	562A279		Decal, Gasoline Only		1
26	303742		Bracket, Taillight, RH		1
27	303773		Bracket, Taillight, LH		1
NS	303547		Out-Service, Alignment, F350		1
NS	301236		Manual, TWS402 (Install per 305717)		1

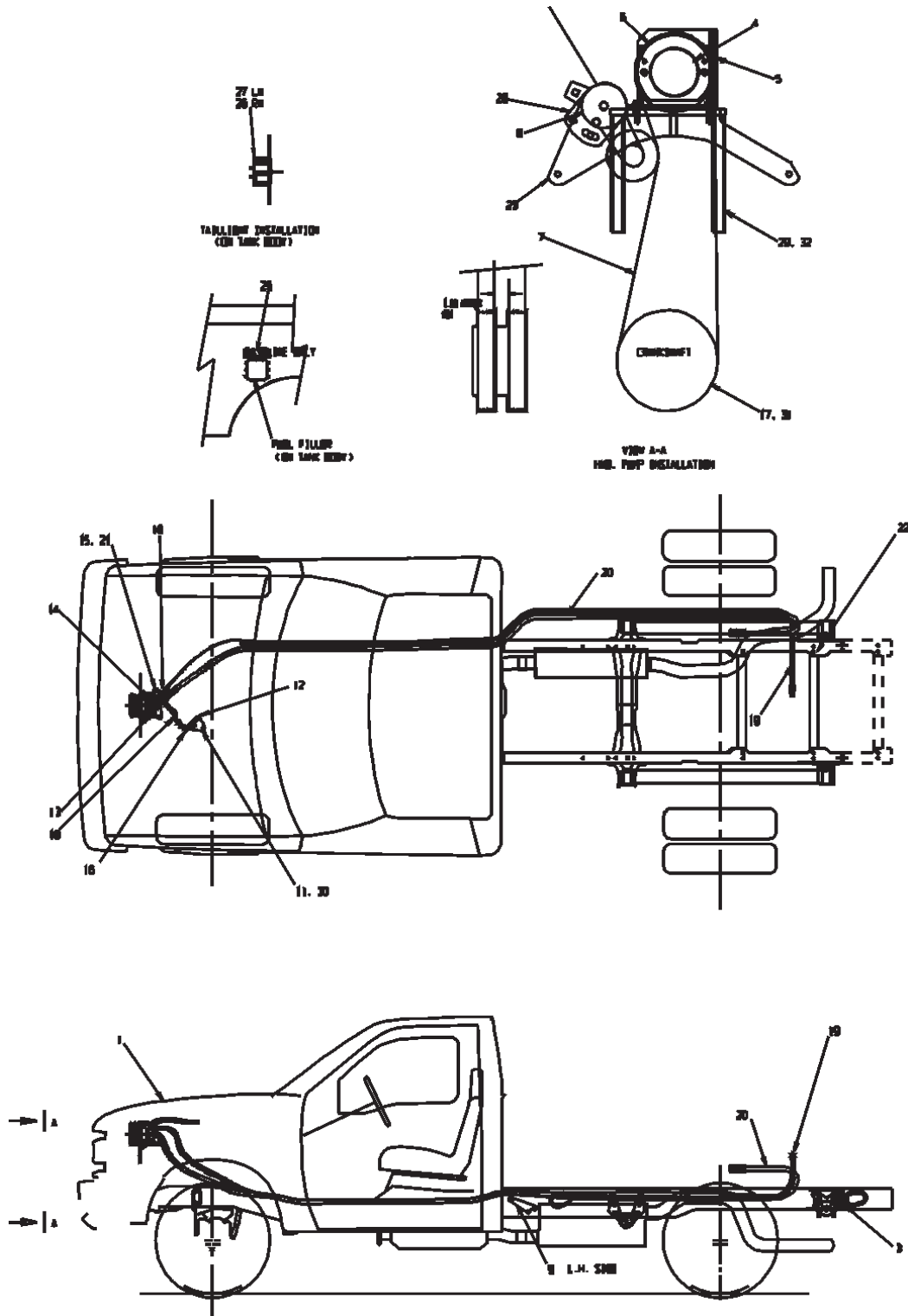


FIGURE 10.
TRUCK PREP, F350, V8 GAS

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
10-	306305		Truck Prep, F350, V8 Gas 2002		Ref
3	303920		Plate, Rear Frame Mtg		2
4	301556		Hyd Pump, Danfoss, .77 CI		1
5	303724		Brkt Wldmt, Hyd Pump		1
6	303722		Clutch, Mag, 8 Groove		1
7	306373		Belt, 8 Groove, 60", 770/402, V8		1
8	306644		Mod, Belt Tensioner		1
9	303918		Nut Plate Weldment, LH Front Mtg		1
10	18404		Cyl, Throttle Advance		1
11	306385		Brkt, Cyl Mtg, Throttle Adv		1
12	3.3051		Nut Coupling, 1/4-28		1
13	200304		Ftg, Hyyd, 16MJ-12MB		1
14	202074		Ftg, Hyd, 45, 08MJ-08FJX-08MJ		1
15	3.2679		Ftg, Hyd, Tee, 08MJ-08FJX-08MJ		1
16	3.1940		Ftg, Hyd, 90, 06MJ-02MP90		1
17	306347		Pulley, 8 Groove		1
18	8945.21		Hose Assy, #6 x 32.64" ST/ST		1
19			Hose Assy, #8 ST/ST		1
20			Hose Assy, #16 ST/ST		1
21	3.2884		Ftg, Hyd, 08FJ-06MJ		1
22	303769		HHCS, 3/8-16 x 1.5, GR8		8
23	306374		Bracket Weldment, Pump		1
25	562A279		Decal, Gasoline Only		1
26	303742		Bracket, Taillight, RH		1
27	303773		Bracket, Taillight, LH		1
28	306377		Plate, Tensioner, Hyd		1
29	306379		Spacer, .65 x .09W x 8.12		2
30	301294.2		Spacer, .75 OD x .38 ID x .44		1
31	306409		HHCS, M10 x 1.5 x 60MM		3
32	306381		HHCS, M10 x 1.5 x 240MM		2
NS	301236		Manual, TWS402, 3-Ring Binder		Ref

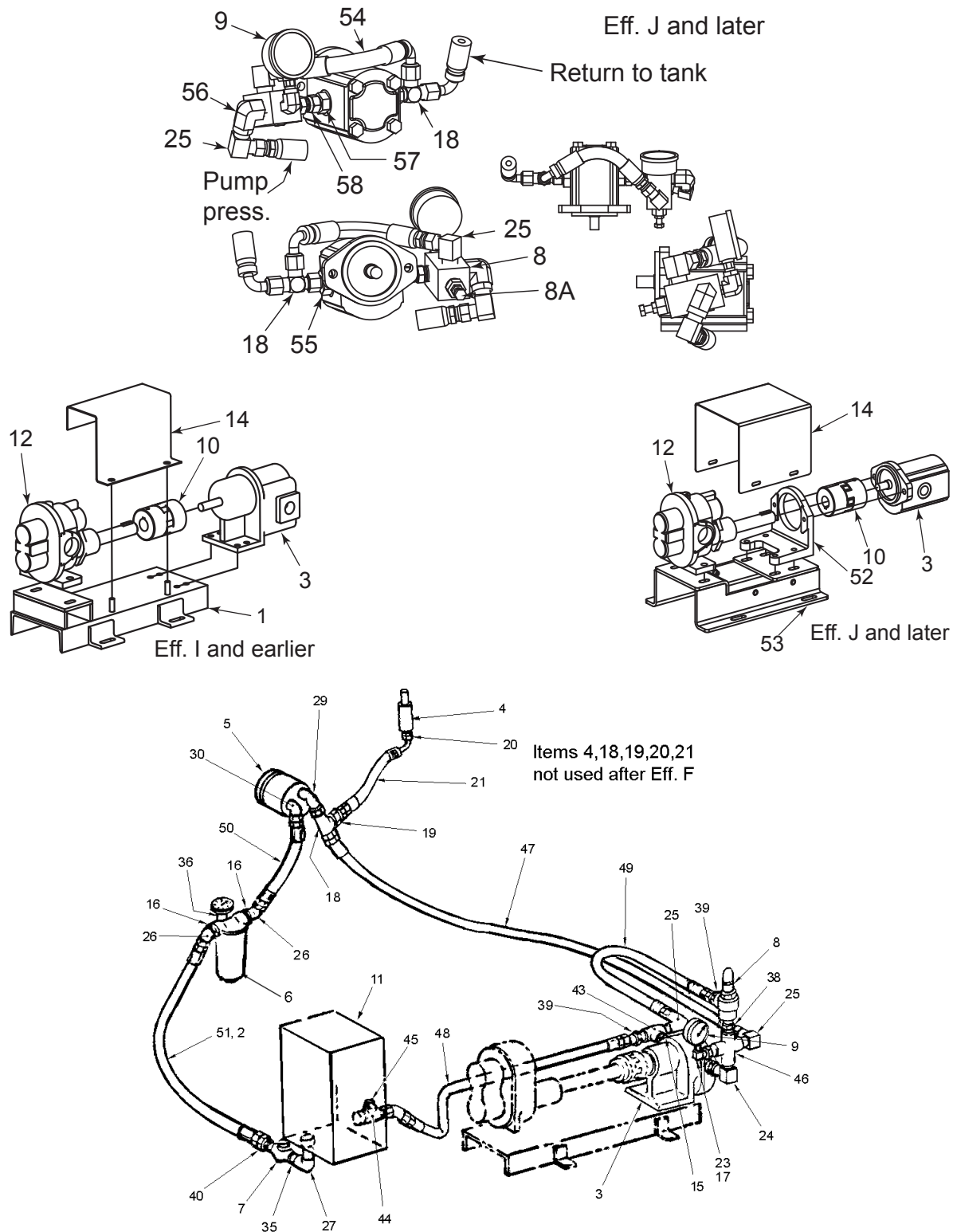


FIGURE 11. 1 of 2
HYDRAULIC INSTALLATION W/O LIFT OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
11-	16181		Hydraulic Installation w/o Lift Option		Ref
1	8516		Base, Motor/Pump		1
2	3.1081	Comm	Clamp		4
3	1.4193	2M023B2A1	Motor, Hydraulic (02892)		1
	309946	PLM20	Motor, Hydraulic 1.61 CIR, 5/8 Key, CCW	J	1
4	18404	H9S-1S	Cylinder, Throttle Advance (45239)		Ref
5	1.0664	HD-1515-C1-C11	Pump, Hydraulic (02892) (1.3362 Seal Kit)		Ref
	303726		Hyd Pmp, Danfoss, Side Ports, (Gas 99 +)	B	Ref
	301556		Pump, Hyd. .77 CI (Diesel 99 & Later)	B	Ref
6	1.5877	FR-257-1B2C	Filter Assembly (incl. element) (02249)		1
	1.2874	L25001	Kit, Element and Seal (02249)		1
7	1.7146		Gate Valve		1
8	1.0911	J50	Valve, Relief, ½ NPT (02249)		1
	1.8453		Manifold Relief	J	1
8A	1.8450		Cartridge, Vlv, Relief, 100-3000 (for 1.8453)	J	1
9	1.0474	J7178	Gauge, Pressure, 0-3000 PSI (98847)		1
10	1.2189	L-100	Coupling, Flexible (75665)		1
11	8197		Reservoir, Hydraulic, 15 Gal.		1
12	1.3129	11510S5	Water Pump (44408) (1.3909 repair)		1
14	302755		Guard, Shaft		1
	309955		Guard, Shaft	J	1
15	3.0241	2081-12-8	Bushing, Reducer (01276)		2
16	3.1385	2081-20-16S	Bushing, Reducer (01276)		2
	F017385		Ftg. Hyd. 24MP-16FP		2
17	3.0235	2081-8-4S	Bushing, Reducer (01276)		1
18	3.2679	203102-8-8S	Tee (01276)		1
	3.1840		Ftg. Hyd. Tee (Gas 99 & Later)		1
19	3.2884	221501-8-6S	Reducer (01276)		1
20	3.1940	2024-2-6	Elbow (01276)		1
21	M8945.21		Hose/Swivel Fitting		Ref
	8945.21		Hose Assy. #6 x 32.6" ST/SL (Gas 99 & Later)		Ref
23	3.0248	2089-4-4S	Elbow, Street, 90 Deg. (01276)		1
24	3.1356	2085-8-8S	Elbow, 90 Deg. (01276)		1
25	3.1566	2024-8-8S	Elbow, 90 Deg. (01276)		2
26	3.1542	2023-16-16S	Elbow, 45 Deg. (01276)		2
27	3.0889	Comm	Elbow, Street, BIP, 1" NPT		1
29	3.2875		Nipple		Ref
	202074		Ftg. Hyd. 45 (Gas 99 & Later)		Ref
30	3.1349	2021-12-8	Nipple (01276)		Ref
	3.2875		Ftg. Hyd. Straight (Gas 99 & Later)		Ref
35	3.0935	Comm	Nipple, Close, 1" NPT		1
36	3.2687	Comm	Elbow, 90 Deg., 1/8" NPT		1
38	3.1416	2083-8-8S	Nipple, Close (01276)		1
39	3.1575	2021-8-8S	Nipple, Adapter (01276)		2
40	3.1540	2021-16-16S	Nipple, Adapter (01276)		1
43	3.1423	2091-8-8S	Tee, Male Run (01276)		1
44	3.2172	2028-8-8S	Tee (01276)		1
45	3.0127	21029-8S	Cap (01276)		1

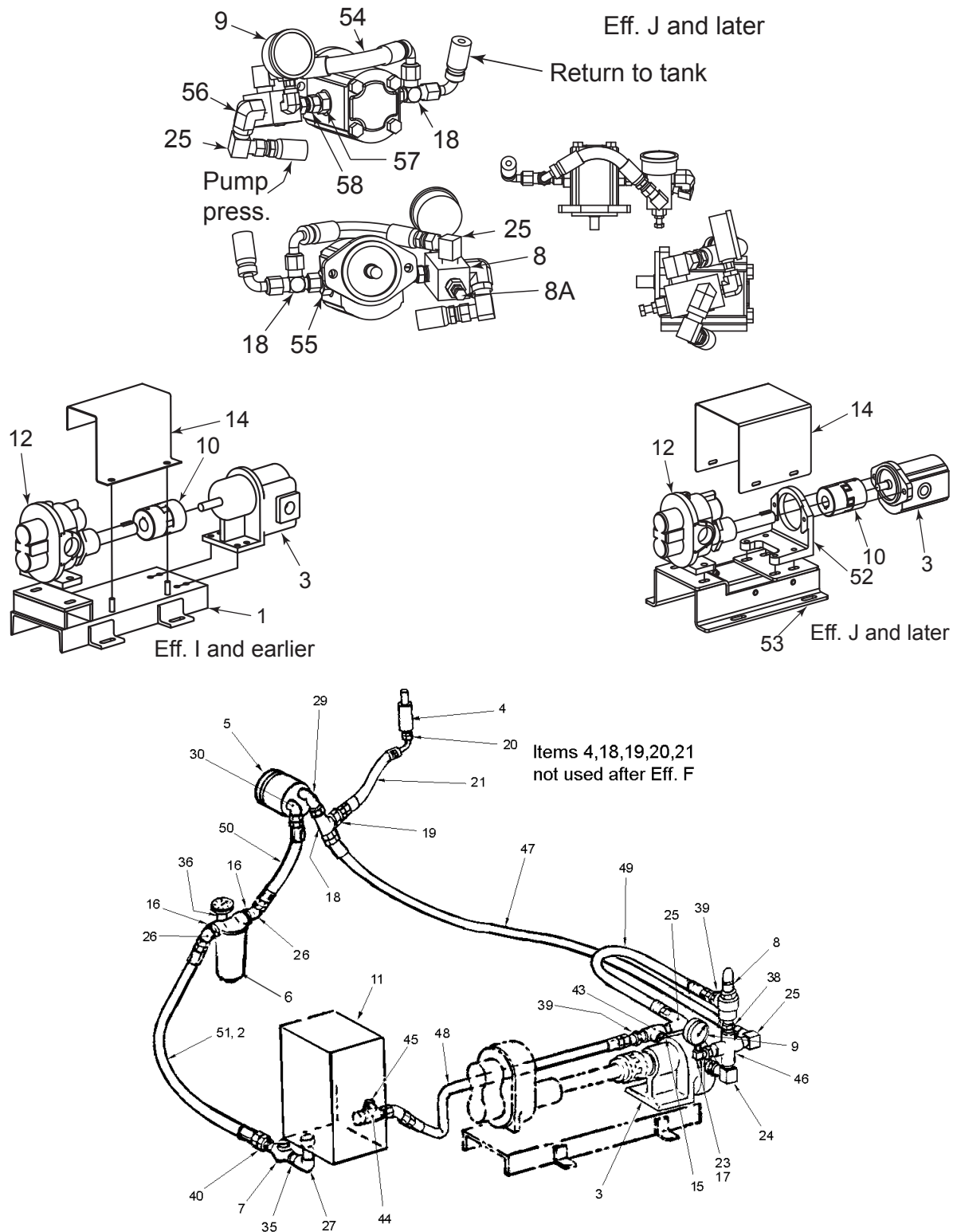


FIGURE 11. 2 of 2
HYDRAULIC INSTALLATION W/O LIFT OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
11-	16181		Hydraulic Installation w/o Lift Option		Ref
46	3.0272	2080-8-8S	Cross (01276)		1
47	8946.51		Hose Assembly, #8M, 216"		Ref
	8946.21		Hose Assy, #8x216.0 ST/EL (Gas 99 & Later)		Ref
48	8797.10		Hose Assembly, #8B, 54.8"		1
49	8946.3		Hose Assembly, #8M, 20.72" ST/ST		1
50	10384.33		Hose Assy, #16 x 180" ST/SL		Ref
51	10384.31		Hose Assembly, #16L, 83" ST/ST		1
52	309947		Mount, Pump/Motor	J	1
53	309950		Base, Assy, Pump Drive	J	1
54	203835		Hose Assy, #8M, 9.50", ST/90	J	1
55	3.2961		Ftg, Hyd, 08MJ-12MB	J	1
56	3.1413		Ftg, Hyd, 08MP-08FP90	J	1
57	3.2703		Ftg, Hyd, 08MJ-10MB	J	1
58	309957		Ftg, Hyd, 08MP-08FJX	J	1

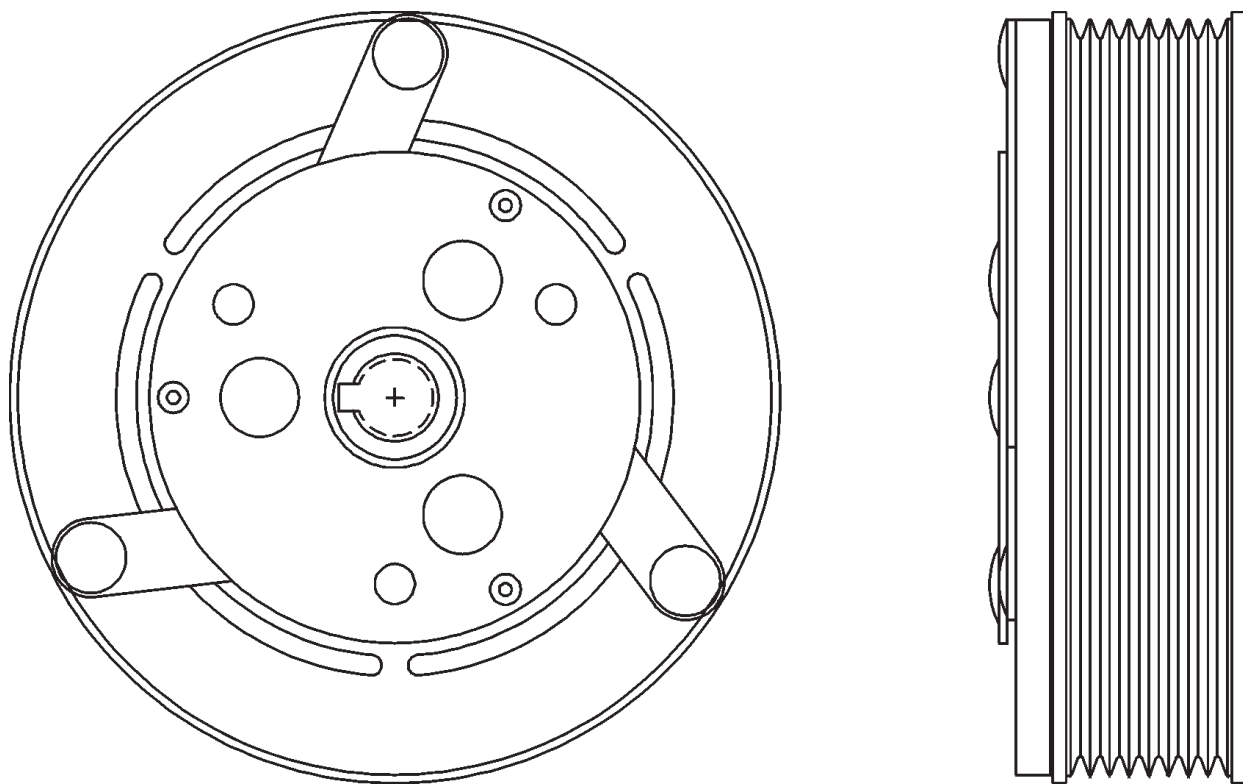


FIGURE 12.
CLUTCH, MAG, 8-GROOVE

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
12-	303722	14195-3	Clutch, MAG, 8-Groove		Ref

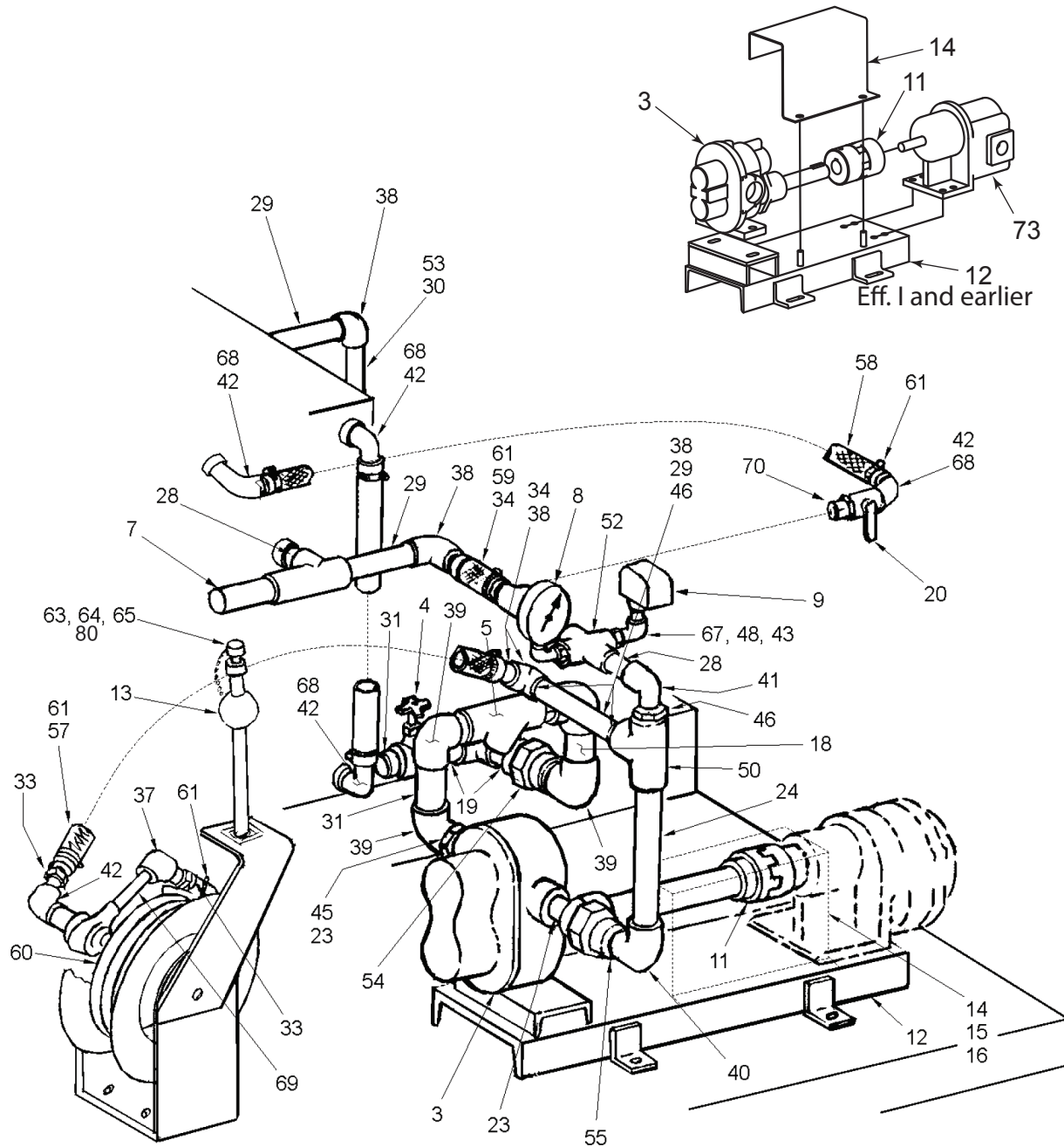


FIGURE 13.
WATER PLUMBING INSTALLATION
1 of 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
13-	9467		Water Plumbing Installation, 1 of 2		Ref
3	1.3129	11510S5	Water Pump (44408) (1.3909 repair)		1
4	1.0890		Valve, Gate		1
5	1.3368		Y-Strainer, 100 Mesh		1
7	304445		Valve, Relief		1
8	1.3548	J4848	Gauge, Pressure, 0-100 PSI (98847)		1
9	2.1736	69BA8	Switch, Pressure, 20-40 PSI (23826)		1
10	20373		Hose Reel (Modified)		1
11	1.2189	L-100	Coupling, Flexible (75665)		1
12	8516		Base, Motor/Pump		1
13	1.8294		Stop, Ball, 1-3/8 hose		1
14	302755		Guard, Shaft		1
15	Comm		Washer, Flat, 3/8		2
16	Comm		Nut, Lock, 3/8-16		2
18	3.0635	Comm	Nipple, 1.50 NPT x Close		3
19	3.1656	Comm	Nipple, 1.50 NPT x 3.00		4
20	9467.20		Valve, Ball 80 MXF, Brass (1.8019)		1
23	3.0634	Comm	Nipple, 1.25 NPT x Close		2
24	3.2919	Comm	Nipple, 1.25 NPT x 9.50		1
28	3.0633	Comm	Nipple, 1.00 NPT x Close		3
29	3.0620	Comm	Nipple, 1.00 NPT x 6.00		2
31	3.0626	Comm	Nipple, 1.25 x 4.00		1
33	3.2787	Comm	Adapter, 0.75 NPTM x 1.00 Hose		2
34	3.0642	Comm	NPTM x 1.00 Hose		3
37	3.0593	Comm	Elbow, 90 Deg., 0.75 NPT		1
38	3.0595	Comm	Elbow, 90 Deg., 1.00 NPT		3
39	3.0599	Comm	Elbow, 90 Deg., 1.50 NPT		5
40	3.0598	Comm	Street El, 1.25 NPT		1
41	3.0596	Comm	Street El, 1.00 NPT		1
42	3.0594	Comm	Street El, 0.75 NPT		5
43	3.2077	Comm	Street El, 0.25 NPT		2
45	3.0566	Comm	Bushing, Reducer, 1.50 x 1.25 NPT		1
46	3.0563	Comm	Bushing, Reducer, 1.25 x 1.00 NPT		2
48	3.0558	Comm	Bushing, Reducer, 1.00 x 1/4 NPT		2
50	3.0661	Comm	Tee, 1.25 NPT		1
51	3.3061	Comm	Tee, 16FP-16FP-12FP	B	1
52	3.2335	Comm	Cross, 1.00 NPT		1

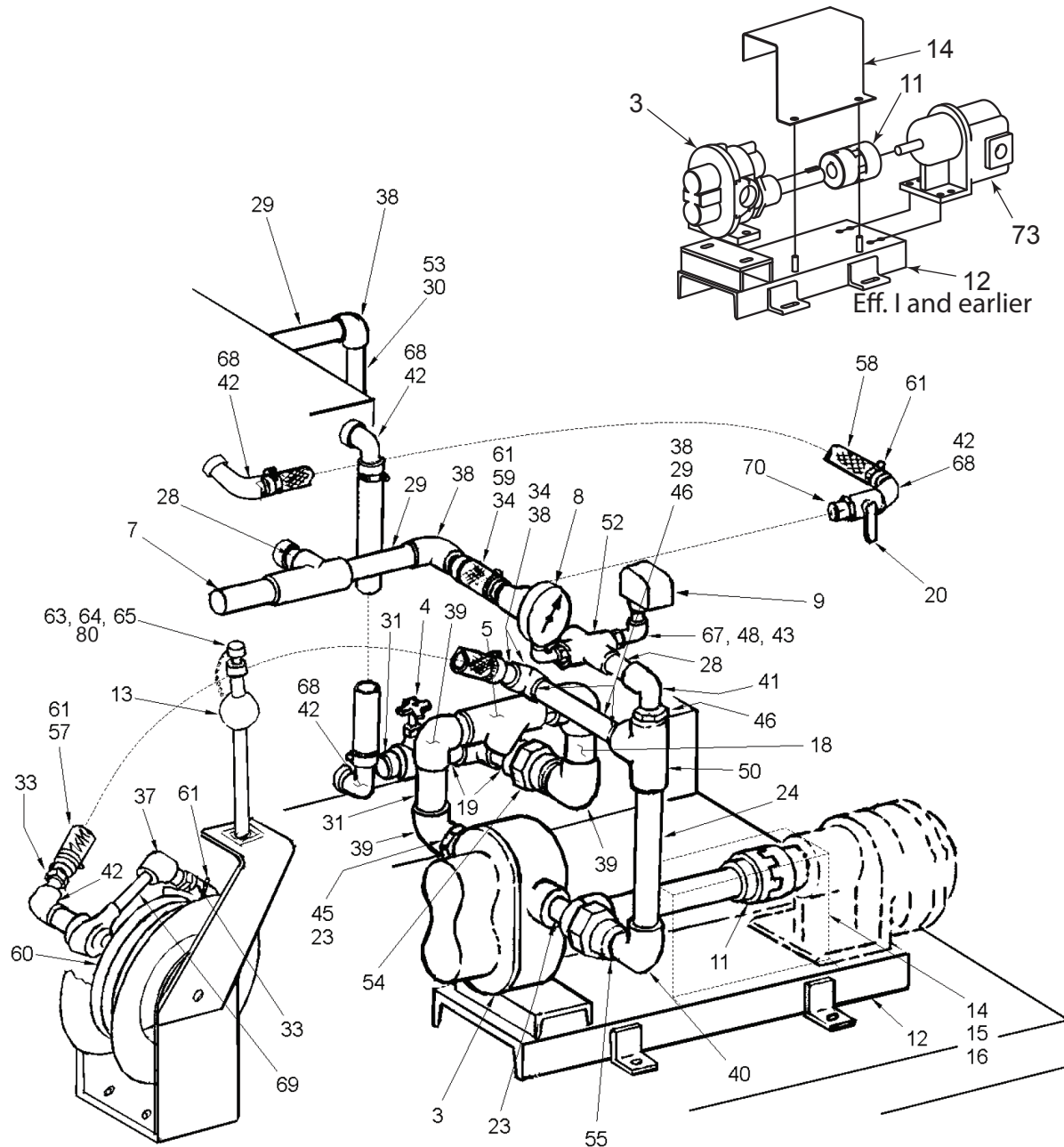


FIGURE 13.
WATER PLUMBING INSTALLATION
2 of 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
13-	9467		Water Plumbing Installation, 2 of 2		Ref
54	3.2096	Comm	Union, 1.50 NPT		1
55	3.0669	Comm	Union, 1.25 NPT		1
56	9.0006	Comm	Hose, Clear, 3/4 ID x 1/8 Wall x 21		1
57	9.1841	Comm	Hose, Clear, 1.00 ID x 1-3/8 OD x 13		1
58	9.1975	Comm	Hose, Clear, 0.75 ID x 31/32 OD x 24		1
59	9.1841	Comm	Hose, Clear, 1.00 ID x 1-3/8 OD		5"
60	9.1841	Comm	Hose, Clear, 1.00 ID x 1-3/8 OD		264"
61	3.1086	Comm	Clamp, Hose		9
63	1.0619	8022-J-12A	Plug (86831)		1
64	1.0293	1041-J-2A	Coupling (86831)		1
65	1.0248	RS161-120	Chain (86831)		1
67	3.1682	Comm	Nipple, Close, 0.25 NPT		1
68	3.0640	Comm	Nipple, 3/4		4
69	3.2959	Comm	Nipple, 3/4 NPT x 7.00		1
70	3.0632	Comm	Nipple, Close, 3/4 NPT		1
71	305258		Breather, 3/4 NPT Sintered Brass		2
72	305615		Decal, Sight Gauge, Water		1
73	1.4193	2M023B2A1	Motor, Hydraulic (02892)		1
80	309988		Instln Clamp, shrink, 1.31-1.5		1
NS	3.0654		Plug, 2" Brass		1

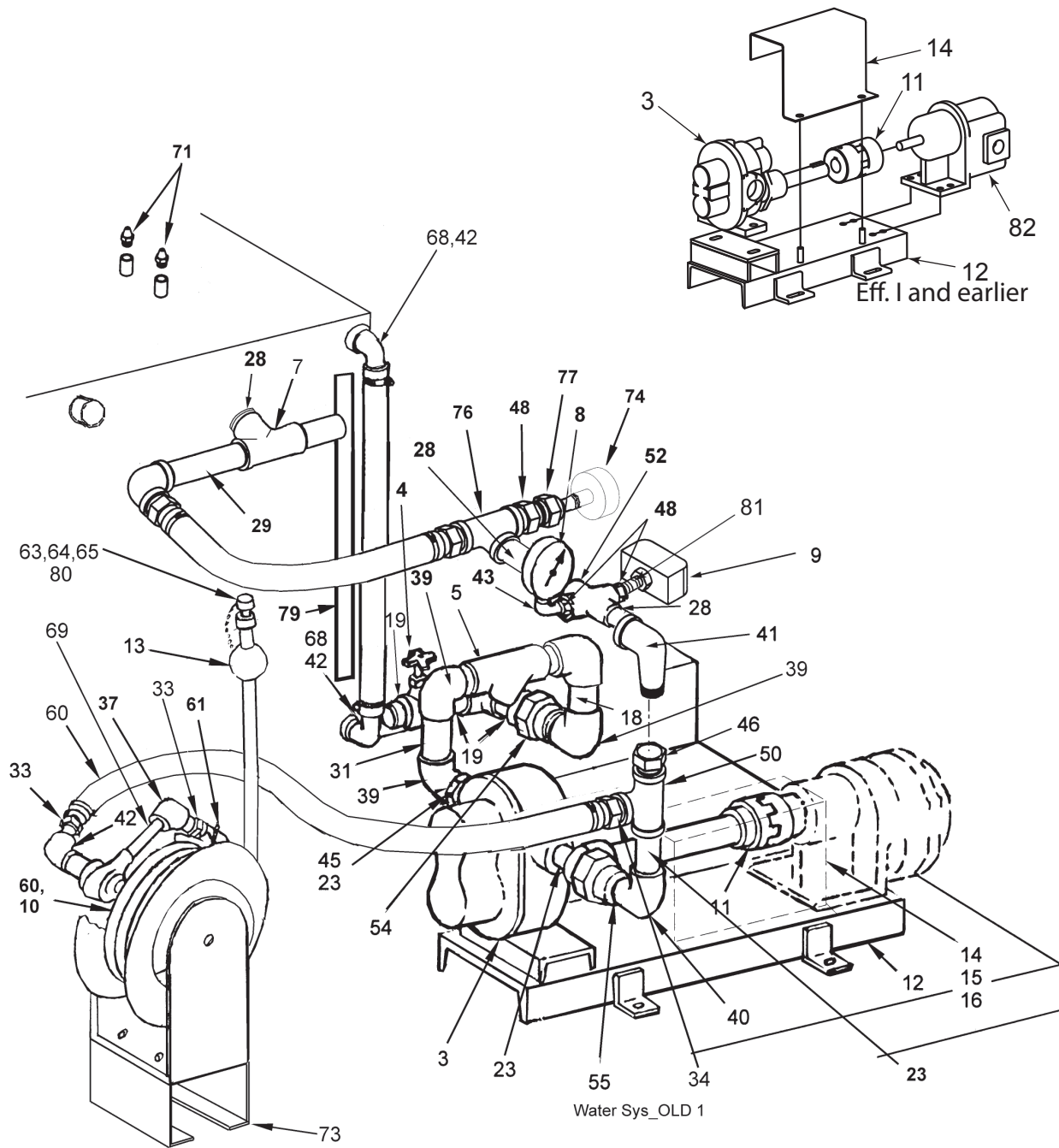


FIGURE 14.
WATER PLUMBING INST. W/PUSH BUTTON, PUMP START OPT, & FILL
PORT OPT 305345
1 of 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
14-	305622		Water Plumbing Inst. w/Push Button Pump Start Opt, & Fill Port Opt 305345, 1 of 2		Ref
3	1.3129	11510S5	Water Pump (44408) (1.3909 repair kit)		1
4	1.0890		Valve, Gate		1
5	1.3368		Y-Strainer, 100 Mesh		1
7	304445		Valve, Relief		1
8	1.3548	J4848	Gauge, Pressure, 0-100 PSI (98847)		1
9	2.1736	69BA8	Switch, Pressure, 20-40 PSI (23826)		1
10	20373		Hose Reel (Modified)		1
11	1.2189	L-100	Coupling, Flexible (75665)		1
12	8516		Base, Motor/Pump		1
13	1.8294		Stop, Ball, 1-3/8 hose		1
14	302755		Guard, Shaft		1
15	Comm		Washer, Flat, 3/8		2
16	Comm		Nut, Lock, 3/8-16		2
18	3.0635	Comm	Nipple, 1.50 NPT x Close		3
19	3.1656	Comm	Nipple, 1.50 NPT x 3.00		4
23	3.0634	Comm	Nipple, 1.25 NPT x Close		3
28	3.0633	Comm	Nipple, 1.00 NPT x Close		3
29	3.0620	Comm	Nipple, 1.00 NPT x 6.00		1
31	3.0626	Comm	Nipple, 1.25 x 4.00		1
33	3.2787	Comm	Adapter, 0.75 NPTM x 1.00 Hose		2
34	3.0642	Comm	16MP-16H		3
37	3.0593	Comm	Elbow, 90 Deg., 0.75 NPT		1
39	3.0599	Comm	Elbow, 90 Deg., 1.50 NPT		5
40	3.0598	Comm	Street El, 1.25 NPT		1
41	3.0596	Comm	Street El, 1.00 NPT		1
42	3.0594	Comm	Street El, 0.75 NPT		4
43	3.2077	Comm	Street El, 0.25 NPT		1
45	3.0566	Comm	Bushing, Reducer, 1.50 x 1.25 NPT		1
46	3.0563	Comm	Bushing, Reducer, 1.25 x 1.00 NPT		2
48	3.0558	Comm	Bushing, Reducer, 1.00 x 1/4 NPT		3
50	3.0661	Comm	Tee, 1.25 NPT		1
52	3.2335	Comm	Cross, 1.00 NPT		1

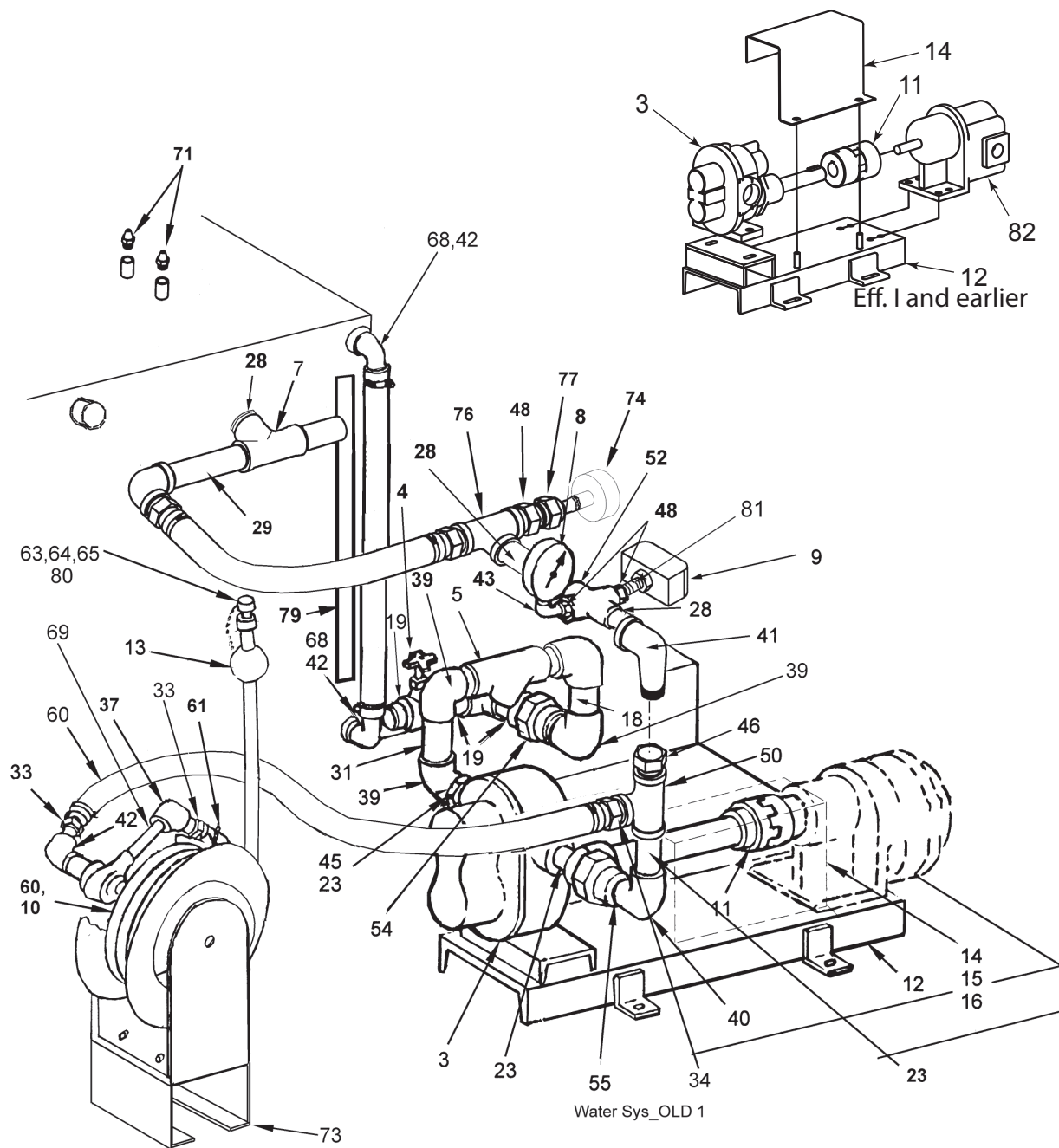


FIGURE 14.
WATER PLUMBING INST. W/PUSH BUTTON, PUMP START OPT, & FILL PORT OPT
305345
2 of 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
14-	305622		Water Plumbing Inst. with Push Button Pump Start Opt & Fill Port Opt 305345, 2 of 2		Ref
54	3.2096	Comm	Union, 1.50 NPT		1
55	3.0669	Comm	Union, 1.25 NPT		1
60	9.1841	Comm	Hose, Clear, 1.00 ID x 1-3/8 OD		282"
61	3.1086	Comm	Clamp, Hose		9
63	1.0619	8022-J-12A	Plug (86831)		1
64	1.0293	1041-J-2A	Coupling (86831)		1
65	1.0248	RS161-120	Chain (86831)		1
68	3.0640	Comm	Nipple, 3/4		4
69	3.2959	Comm	Nipple, 3/4 NPT x 7.00		1
71	305258		Breather, 3/4 NPT Sintered Brass		2
73	305289		Stand, Hose Real		1
74	2.1585		Pressure Switch 4 PSI		
76	3.0660		16FP-16FP-16FP Tee		1
77	F100671		04MP-02FP		2
79	305615		Decal, RH Side of Sight Gauge		Ref
	305329		Decal, LH Side of Sight Gauge		Ref
80	309988		Instln, Clamp, Shrink, 1.31-1.5		1
81	3.1682		Ftg, P.N, 04MP-Close, Brass		1
82	1.4193	2M023B2A1	Motor, Hydraulic (02892)		1

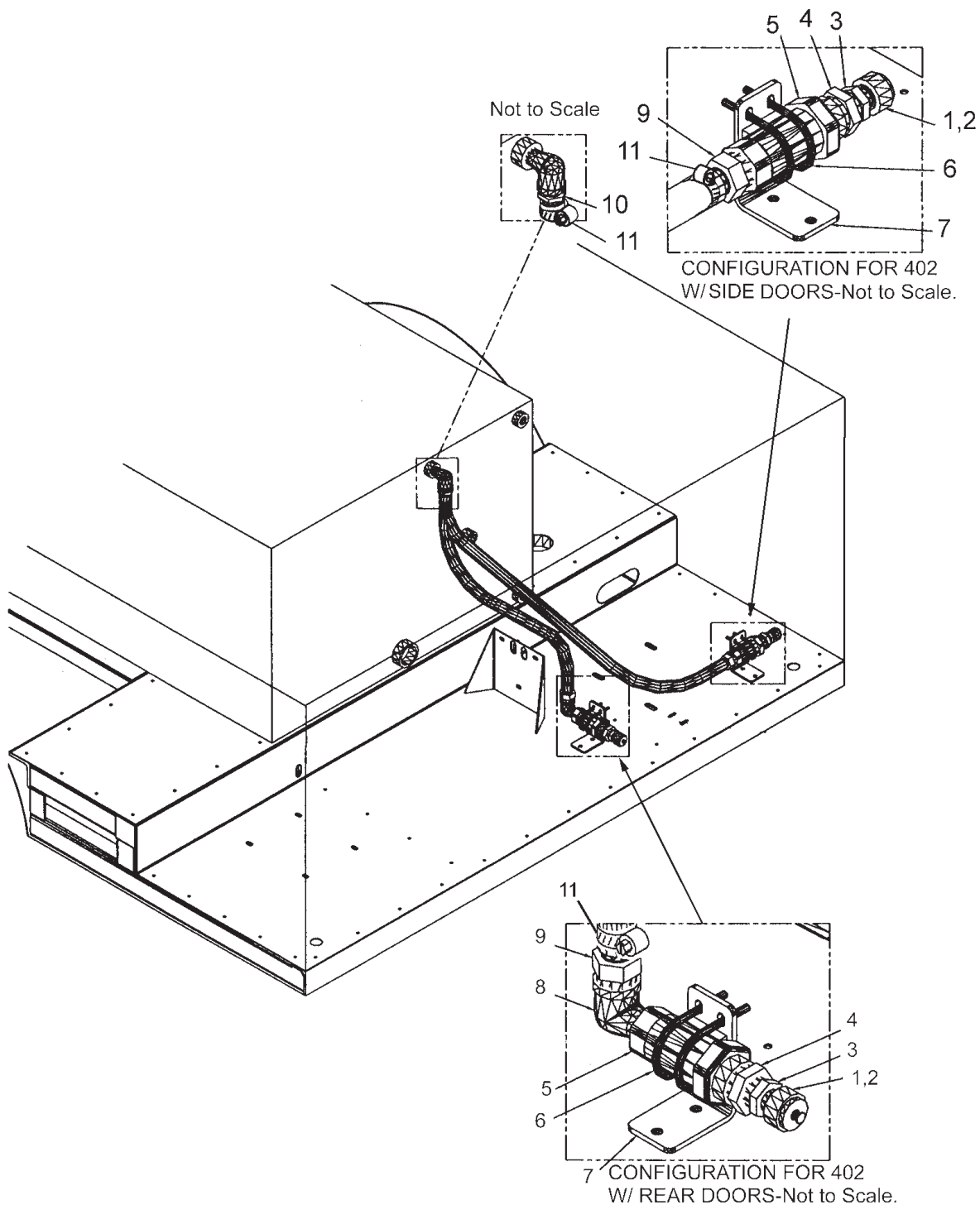


FIGURE 15.
FILL PORT WITH BACKFLOW, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
15-	305345		Fill Port with Backflow Option		Ref
1	1.8278		Cap, Potable Water, 3/4		1
2	1.0248		Chain Assembly		1
3	1.0590		Nipple, Water, Pot., 3/4		1
4	3.1227		Bushing, 1 x 3/4, Brass		1
5	1.7969		Valve, Backflow		1
6	12654.31		U-Bolt, 1/4-20, 1-3/4, 3		2
7	305346		Bracket, Valve Mounting, Backflow		1
8	3.0596		Ftg, Pipe, Ell, 16MP-16F		1
9	3.0642		Ftg, Hyd, 16MP-16H, Brass		1
10	3.2787		Ftg, Hyd, 12MP-16H, Brass		1
11	3.1086		Clamp, Hose, S/S 13/16-1 1/2		2

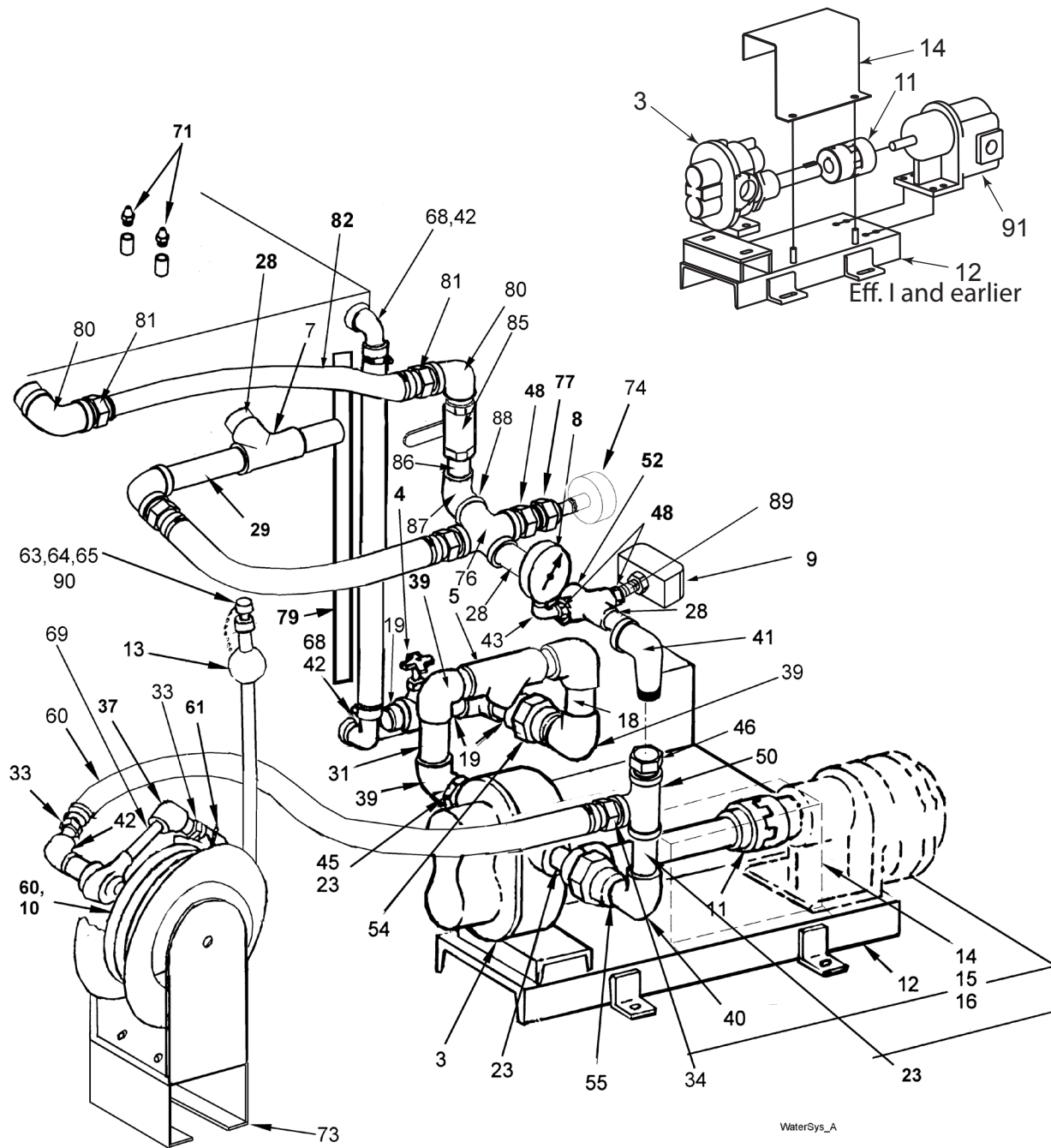


FIGURE 16.
WATER PLUMBING INST. WITH PUSH BUTTON PUMP START OPT.
1 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
16-	305622		Water Plumbing Inst. with Push Button Pump Start Opt., 1 of 2		Ref
3	1.3129	11510S5	Water Pump (44408) (1.3909 repair kit)		1
4	1.0890		Valve, Gate		1
5	1.3368		Y-Strainer, 100 Mesh		1
7	304445		Valve, Relief		1
8	1.3548	J4848	Gauge, Pressure, 0-100 PSI (98847)		1
9	2.1736	69BA8	Switch, Pressure, 20-40 PSI (23826)		1
10	20373		Hose Reel (Modified)		1
11	1.2189	L-100	Coupling, Flexible (75665)		1
12	8516		Base, Motor/Pump		1
13	1.8294		Stop, Ball, 1-3/8 hose		1
14	302755		Guard, Shaft		1
15	Comm		Washer, Flat, 3/8		2
16	Comm		Nut, Lock, 3/8-16		2
18	3.0635	Comm	Nipple, 1.50 NPT x Close		3
19	3.1656	Comm	Nipple, 1.50 NPT x 3.00		4
23	3.0634	Comm	Nipple, 1.25 NPT x Close		3
28	3.0633	Comm	Nipple, 1.00 NPT x Close		3
29	3.0620	Comm	Nipple, 1.00 NPT x 6.00		1
31	3.0626	Comm	Nipple, 1.25 x 4.00		1
33	3.2787	Comm	Adapter, 0.75 NPTM x 1.00 Hose		2
34	3.0642	Comm	16MP-16H		3
37	3.0593	Comm	Elbow, 90 Deg., 0.75 NPT		1
39	3.0599	Comm	Elbow, 90 Deg., 1.50 NPT		5
40	3.0598	Comm	Street El, 1.25 NPT		1
41	3.0596	Comm	Street El, 1.00 NPT		1
42	3.0594	Comm	Street El, 0.75 NPT		4
43	3.2077	Comm	Street El, 0.25 NPT		2
45	3.0566	Comm	Bushing, Reducer, 1.50 x 1.25 NPT		1
46	3.0563	Comm	Bushing, Reducer, 1.25 x 1.00 NPT		2
48	3.0558	Comm	Bushing, Reducer, 1.00 x 1/4 NPT		2
50	3.0661	Comm	Tee, 1.25 NPT		1
52	3.2335	Comm	Cross, 1.00 NPT		1

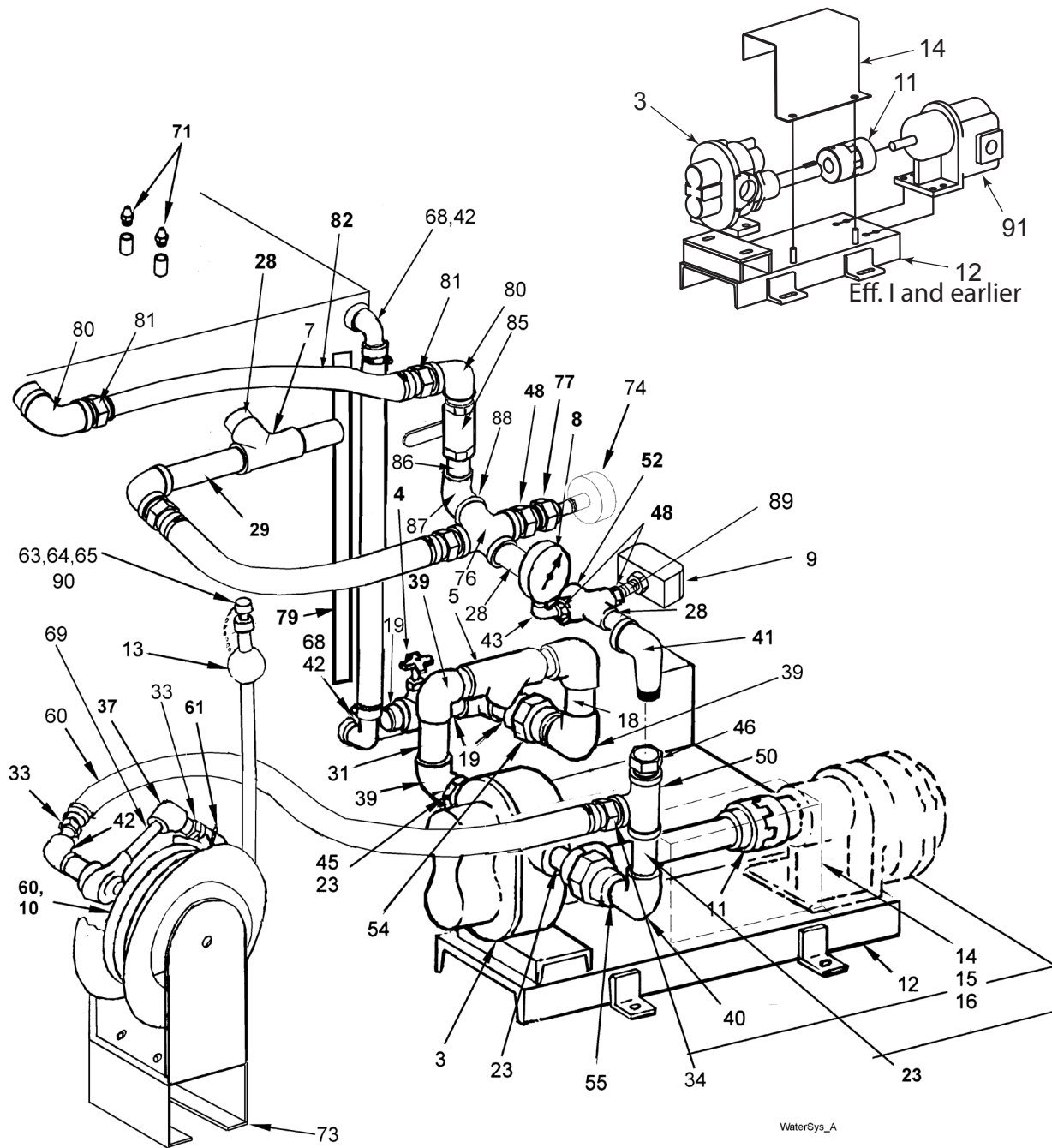


FIGURE 16.
WATER PLUMBING INST. WITH PUSH BUTTON PUMP START OPT.
2 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
16-	305622		Water Plumbing Inst. with Push Button Pump Start Opt., 2 of 2		Ref
54	3.2096	Comm	Union, 1.50 NPT		1
55	3.0669	Comm	Union, 1.25 NPT		1
60	9.1841	Comm	Hose, Clear, 1.00 ID x 1-3/8 OD x 26'		282"
61	3.1086	Comm	Clamp, Hose		9
63	1.0619		Plug, Coupling		1
64	1.0293	1041-J-2A	Coupling (86831)		1
65	1.0248	RS161-120	Chain (86831)		1
68	3.0640	Comm	Nipple, 3/4		4
69	3.2959	Comm	Nipple, 3/4 NPT x 7.00		1
71	305258		Breather, 3/4 NPT Sintered Brass		2
73	305289		Stand, Hose Reel		1
74	2.1585		Pressure Switch 4 PSI		1
76	3.2335		Ftg. Pipe, C, 16FP-16FP16FP-16FP		1
77	F100671		04MP-02FP		1
79	305615		Decal, RH Side of Sight Gauge		Ref
	305329		Decal, LH Side of Sight Gauge		Ref
80	3.0594		Ftg. Pipe, Ell, 3/4 90D, M/F, BR		2
81	3.0642		Ftg. Hyd, 16MP-16A-BRS		3
82	9.1975		Hose, Food Grade, .75 x .969		24"
85	9467.20		Valve, Ball, 08 MxF, Brass		1
86	3.0632		Nipple 3/4 NPT, Closed		1
87	3.0596		Ftg. Pipe, Ell, 16MP-16FP90		1
88	3.0581		Ftg, 16MP-12FP Brass		1
89	3.1682		Ftg, P,N, 04MP-Close, Brass		1
90	309988		Instln, Clamp, Shrink, 1.31-1.5		1
91	1.4193	2M023B2A1	Motor, Hydraulic (02892)		1
NS	3.0654		Plug, 2" Brass		1
NS	3.0654		Plug, 2" Brass		1
NS	3.0595		Ftg, P, Ell, 16FP-16FP90		2
NS	3.3061		Ftg, P, Tee, 16FP-16FP-12FP		1
NS	9.0006		Hose 0.75 ID, PVC, Clear		21"
NS	305376		Ftg, P,N, 20MP-3" L, Brass		1
NS	3.3136		Ftg,P,PL, 16MP, CTSK, Sq.		1

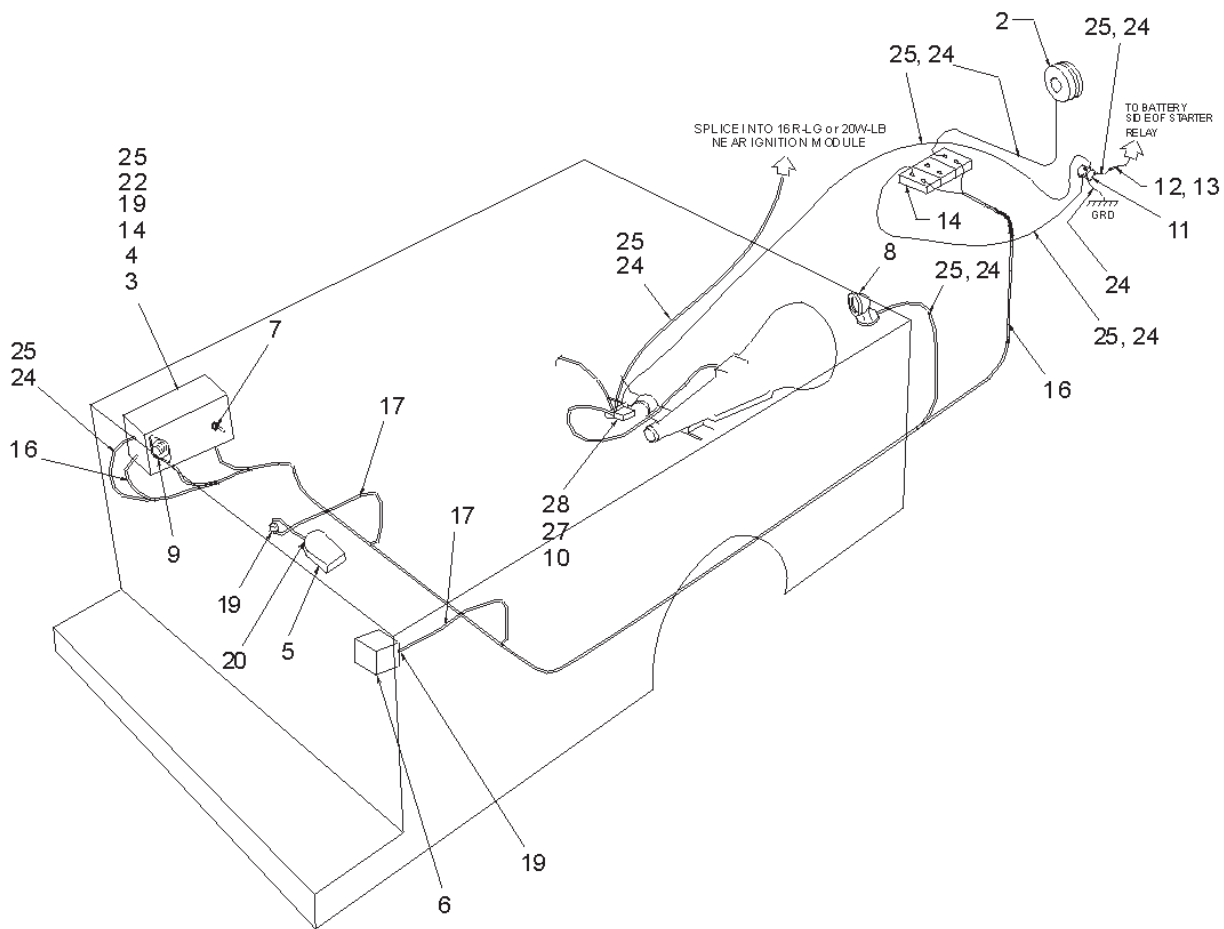


FIGURE 17.
ELECTRICAL ASSEMBLY, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
17-	19854		Electrical Assembly, 96/97		Ref
2	2.1948	28A-S-12V 11253	Clutch, Magnetic (34398)	A	Ref
3	16704		Junction Box		1
4	6867.5		Gasket		1
5	2.2623	1025-C-25P-X	Switch, Foot, Weatherproof		1
6	2.1736	69BA8	Switch, Pressure, 20-40 PSI (23826)		Ref
7	2.3013	1TL1-2	Switch, Toggle, SPST (91929)		1
8	2.0435	538-000-CHR	Light, Swivel Spot, 12V/30W (46576)		1
9	2.3905	20308	Light, Surface Mount, 12V, 32CP (13445)		1
10	2.3648	150-905	Relay, Automotive, SPDT, 12VDC (80089) (Use SB502 for repairs)		1
11	2.1401	70-902	Relay, Automotive Power, SPNO, 12VDC/80A (80089)		1
12	2.1922	726108	Holder, Fuse, In-line (70903)		1
13	2.2531	Comm	Fuse, Non-Time Delay, 32V/20A		1
14	2.1718	M428	Block, 8-Terminal (13445)		2
16	2.0891		Cable, Hard Service, #12/3, 600V, Type SO		26'
17	2.0890		Cable, Hard Service, #12/2, 600V, Type SO		21'
19	2.0180	CG-5050	Connector, Cord (03743)		6
20	2.0181	CG-5075	Connector, Cord (03743)		1
22	2.3442	BLSG50	Locknut, Sealing, 1/2"		4
24	2.3478	64469-R	Conduit, Flex. Auto., 1/4" (77070)		50'
25	2.1532	Comm	Wire, Automotive, 14 AWG, SAE J1128 Type GPT Black		60'
27	Comm		HHCS, 1/4-20 x 1.00		1
28	Comm		Nut, Lock, 1/4-20		1

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
NS	309980		LED Bulb for 2.3905, Option		Ref
NS	310016		Bulb Mod, (309939) Conf		1

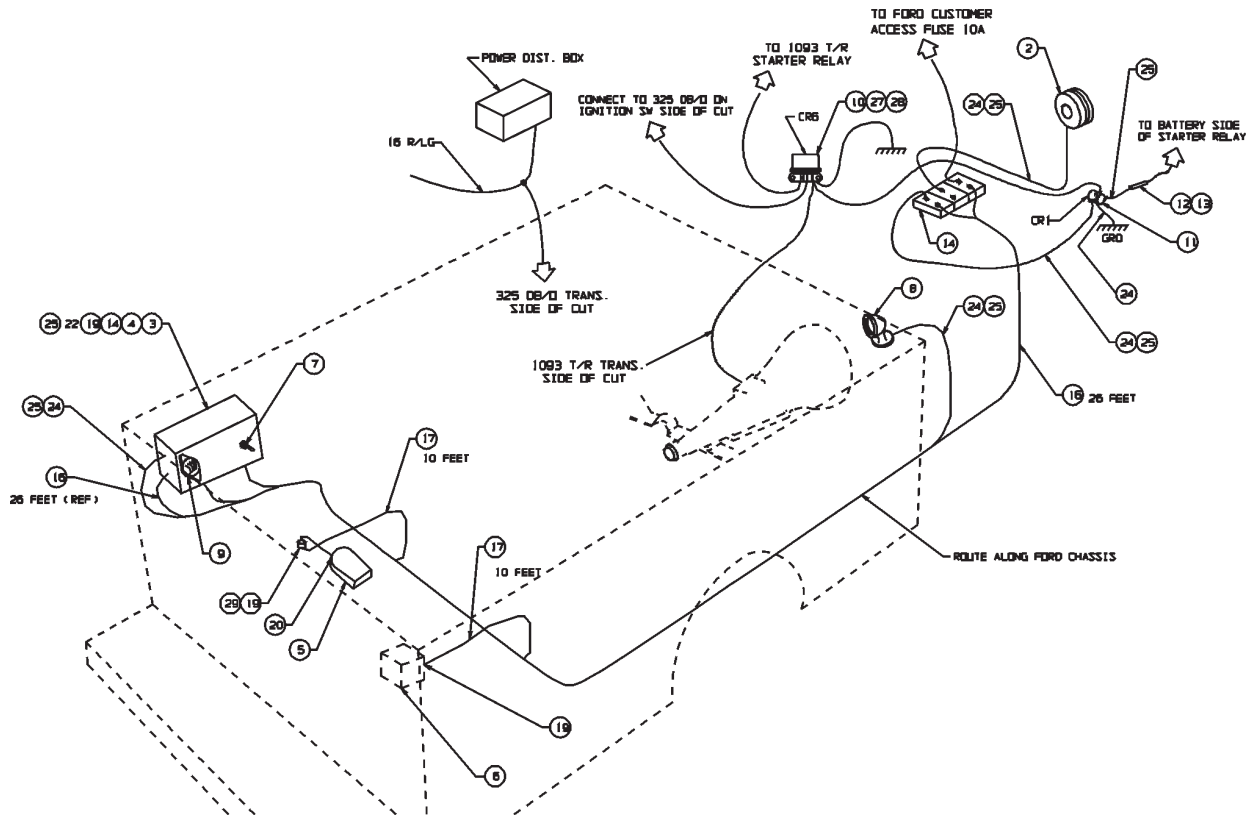


FIGURE 18.
ELECTRICAL ASSEMBLY, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
18-	19854		Electrical Assembly, 99 & Later		Ref
1	2.3478	Comm	Conduit, 1/4" Flexguard		40'
2	303722		Clutch/Pulley, Magnetic, 8 Groove (34398)	A	Ref
3	16704		Junction Box		1
4	6867.5		Gasket		1
5	2.2623	1025-C-25P-X	Switch, Foot, Weatherproof		1
6	2.1736	69BA8	Switch, Pressure, 20-40 PSI (23826)		Ref
7	2.3013	1TL1-2	Switch, Toggle, SPST (91929)		1
8	2.0435	538-000-CHR	Light, Swivel Spot, 12V/30W (46576)		1
	2.0435	538	Floodlight (46576) (Opt)		1
	302937		Spacer, Disk, Light		1
9	2.3905	20308	Light, Surface Mount, 12V, 32CP (13445)		1
10	2.3648	150-905	Relay, Automotive, SPDT, 12VDC (80089) (Use SB502 for repairs)		1
11	2.1401	70-902	Relay, Automotive Power, SPNO, 12VDC/80A (80089)		1
12	2.1922	726108	Holder, Fuse, In-line (70903)		1
13	2.2531	Comm	Fuse, Non-Time Delay, 32V/20A		1
14	2.1718	M428	Block, 8-Terminal (13445)		2
16	2.0891		Cable, Hard Service, #12/3, 600V, Type SO		26'
17	2.0890		Cable, Hard Service, #12/2, 600V, Type SO		21'
19	2.0180	CG-5050	Connector, Cord (03743)		6
20	2.0181	CG-5075	Connector, Cord (03743)		1
22	2.3442	BLSG50	Locknut, Sealing, 1/2"		4
24	2.3478	64469-R	Conduit, Flex. Auto., 1/4" (77070)		50'
25	2.1532	Comm	Wire, Automotive, 14 AWG, SAE J1128 Type GPT Black		60'
27	Comm		HHCS, 1/4-20 x 1.00		1
28	Comm		Nut, Lock, 1/4-20		1

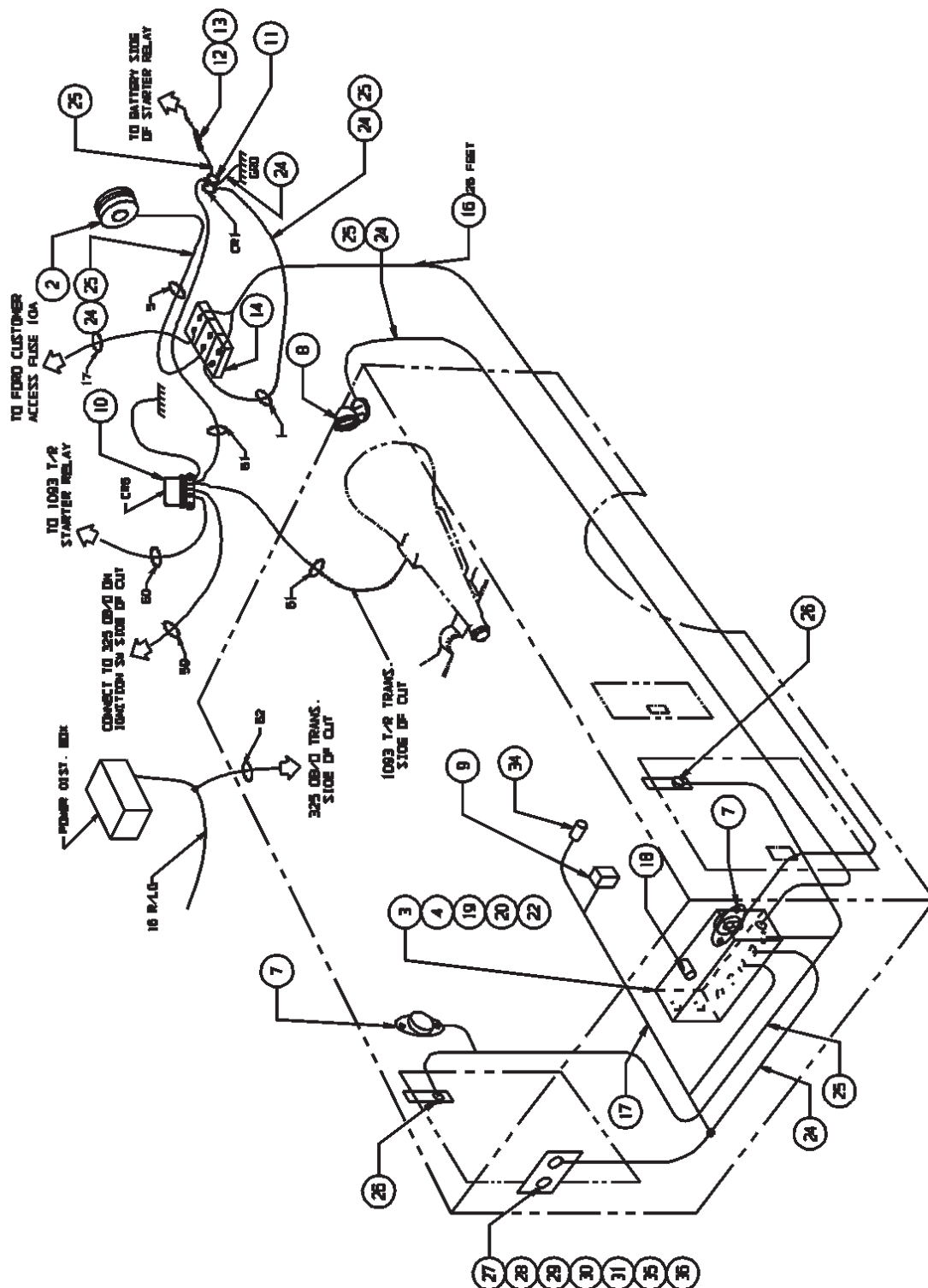


FIGURE 19.
ELECTRICAL ASSEMBLY, 402 SIDE DOORS

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
19-	305626		Electrical Assembly, 402 Side Doors		Ref
2	303722		Clutch/Pulley, Magnetic, 8 Groove (34398)		Ref
3	16704		Box Control, 4 x 4 x12		1
4	6867.5		Detail, Control Box		1
7	2.3905		Light, Surface Mounting, 12V		2
8	2.0435		Light, Swivel Spot		1
9	2.1736		Pressure Switch 42 PSI		Ref
10	2.3648		Relay, 12VDC, SPDT, 15A, (Use SB502 for repairs)		2
11	2.1401		Relay, Power, SPNO, 12VDC/80A		1
12	2.1922		Holder, Fuse		1
13	2.2531		Fuse, 20 AMP, AGW, Buss		1
14	2.1718		Block, Terminal, 8		2
16	2.0891		Wire 12/3 SO 600V		312"
17	2.0890		Wire 12/2 SO		252"
18	2.1991		Switch Toggle SPST		1
19	2.0180		Connector Cord 1/2" Hub		6
20	2.0181		Connector Cord 3/4" Hub		1
22	2.3442		Nut, 1/2 Electric Seal		4
24	2.3478		Conduit 0.25 Flexguard		600"
25	F006612		Wire 14GA Blk GXL		720"
26	2.0739		Switch, Stoplight, Plunger Type		2
27	306386		Operator, Switch, P/B, Red Momnt		1
	308910		Operator, Switch, P/B, Red Momnt	I	1
28	306387		Operator, Switch, P/B, Green Momnt		1
	308911		Operator, Switch, P/B, Green Momnt	I	1
29	19782		Adapter, Pushbutton Switch		2
30	2.3919		Switch, Ball Operated, N/C		1
31	2.3356		Switch, Ball Operated, N/O		1
33	2.3786		Connector, Cord 0.5 Hub 0.125 Cab		1
34	2.1585		Switch, Press, 4# SPDT		1
35	2.3889		Grease, DI Electric, 5.3 oz Tube		A/R
36	306388		Shroud, Switch, Clear, P/B, Flush		2
	308912		Shroud, Switch, Clear, P/B, Flush	I	2

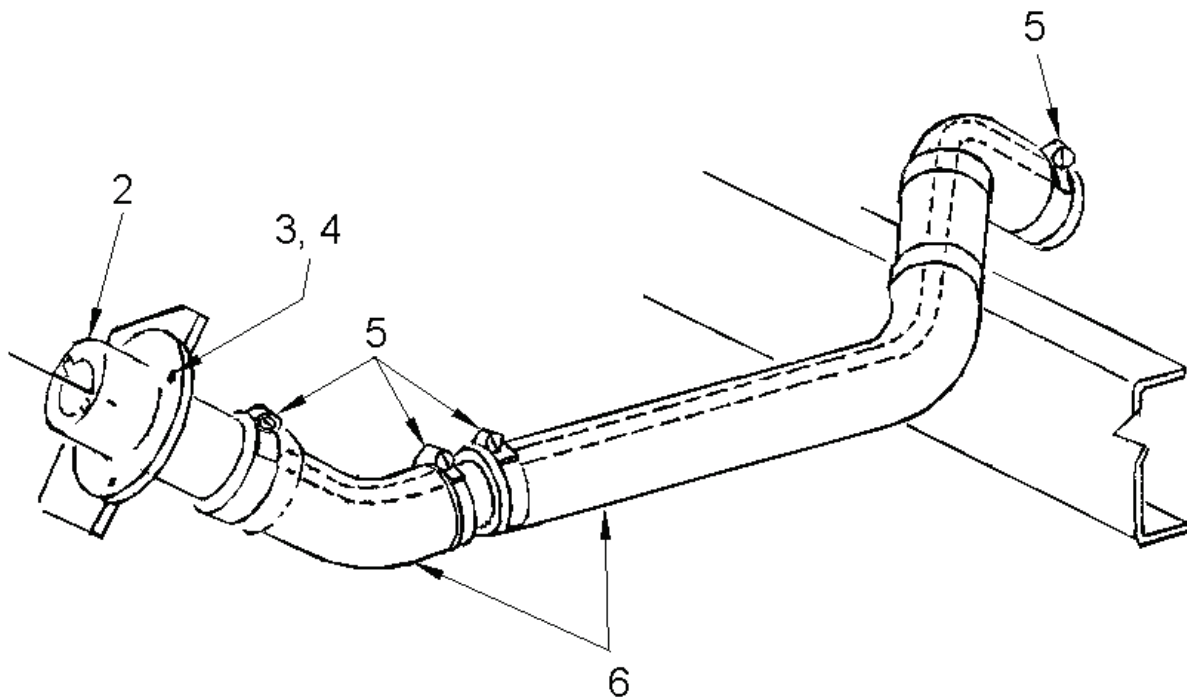


FIGURE 20.
FUEL TANK FILL PIPE, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
20-	6850.45		Fuel Tank Fill Pipe, 96/97		REF
2	1.7899		Fill Unit (w/out Baffle)		1
3	Comm		Screw, #10-32 x 0.75		3
4	Comm		Nut, Lock, #10-32		3
5	3.1084	QS200-M10S	Clamp, Hose, 58" (62789)		4
6	9.0884		Hose, Fuel, 5/8" OD x 3/8" ID		2.5"

NOTE: 99 & Later Chassis uses kit furnished with F300 chassis.

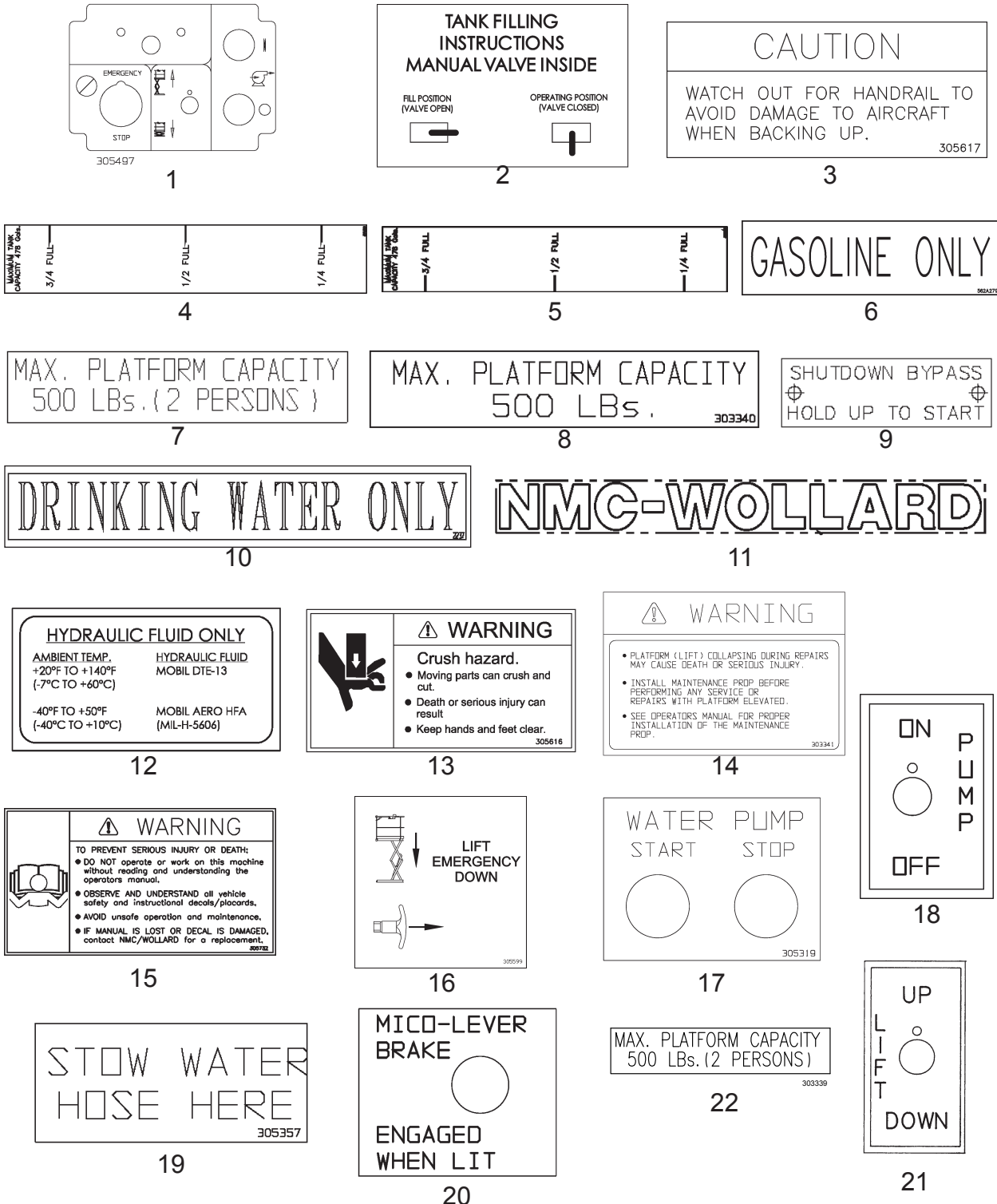
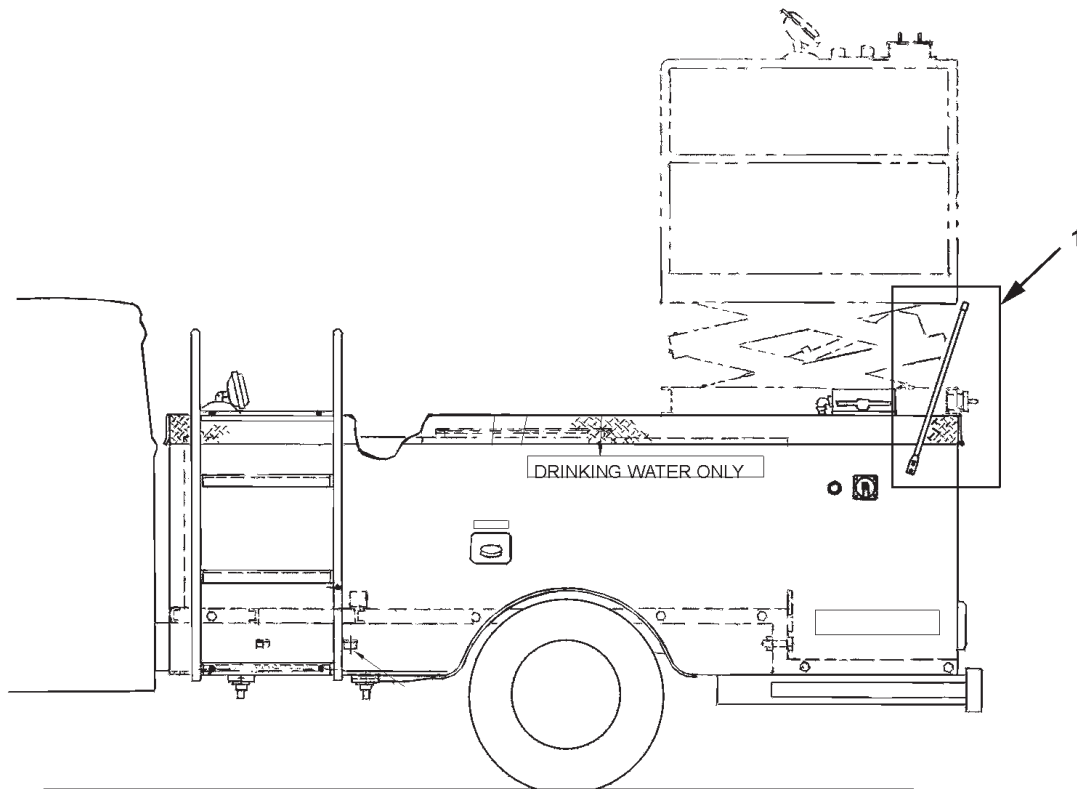


FIGURE 21.
PLACARD ASSEMBLY

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
21-	305618		Placard Assembly		Ref
1	305497		Decal, Control Box, Lift, 402		1
2	562A282		Placard, Tank Fill Instructions		1
3	305617		Decal Caution, Driving w/Lift		1
4	305329		Decal, Sight Gauge		1
5	305615		Decal Sight Gauge		1
6	562A279		Decal, Gasoline Only		1
7	562A339		Placard, "Max Load 500 Lbs"		1
8	303340		Decal, Max Platform Capacity 500		1
9	562A347		Placard, Low Oil Bypass		1
10	2237		Decal, Drinking Water		1
11	306792		Kit, Decals, N-W, Black, Large		1
	306521		Decal, NMC-Wollard, Blk		2
12	562A503		Placard, Hyd. Fluid		1
13	305616		Decal, Warning, Crush Hazard		1
14	303341		Decal, Warning		1
15	305732		Decal, Warning, Read Manual		1
16	305599		Decal, Lift Emergency Down		1
17	305319		Decal, Pump Start/Stop		1
18	562A206		Placard, Pump, ON/OFF		1
19	305357		Decal, Stow Water Hose Here		1
20	562A408		Placard, "Brake Engaged"		1
21	M562A181		Decal, Lift Up/Down		1
22	303339		Decal, Max Platform Cap.		1
NS	562A295		Placard, Lift Up		1
NS	562A54		Placard, 110V, AC-Only		1
NS	562A317		Placard, Heat, Lamp, ON/OFF		1
NS	560A89		Decal, Diesel Fuel Only		1
NS	38713		Decal, Wollard		2
NS	305332		Decal, Warning, Rotating Parts		1
NS		A48449	Decal, Patent		1
NS		A60058	Decal, Morse		1
NS	562A284		Decal, No Step (306768 Top Deck)		1



**FIGURE 22.
BODY MARKERS, OPTION**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
22-	305280		Body Markers, Optional		Ref
1	37203		Marker, Snowplow, Orange (2 per package)		1

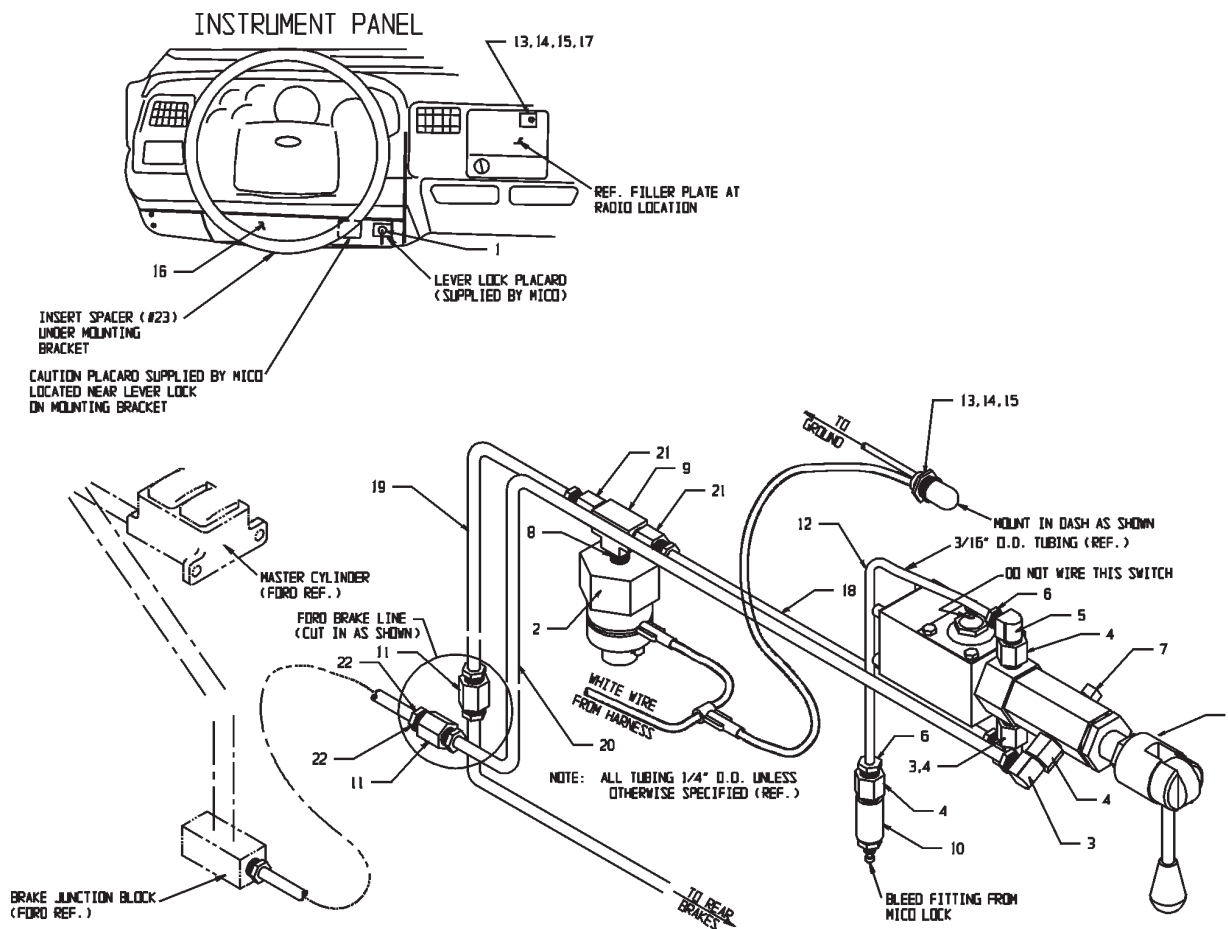


FIGURE 23.
BRAKE LOCK, MICO LEVER, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
23-	305383		Brake Lock, Mico Lever, Option	B	Ref
1	1.8832		Brake Lock Assy.		1
			Pop Rivet	A	6
2	2.3305		Sw., Bk. Pressure		1
3	3.2687		Ftg., Hyd., Ell, M/F, Br.		2
4	3.3356		Ftg., Hyd., M/F, Br		4
5	3.2202		Ftg., Hyd., Ell, M/F, Br		1
6	3.0397		Nut, Inv Flr, 3/16 T x 3/8-24		2
7	3.0648		Plug, 1/8 Npt, Br		1
8	3.0929		Nipple, Close, 1/8 Blk Pipe		1
9	3.3003		Ftg., Pipe, Tee, 02, Br		1
10	3.0839		Ftg., Coupling, 1/8 Npt		1
11	305587		Ftg, Br, Union, 04F-04F	B	2
	1.8426		Union, Inv. Flare, Brass	A	1
12	9.1571		Tbg, Brake, 3/16 O.D. x .048 W	C	11.25"
13	2.3511		Holder, Lamp, w/Nut & Washer		1
14	2.3002		Bulb, #382, Indicator, 14V		1
15	2.3001		Lens, Green, Non-Diffusing		1
16	305631		Brkt., Micolock Mtg.	B	1
	302558		Brkt., Micolock Mtg.	A	1
	302574		Micro Lever Brake Lock, Opt.	A	Ref
17	562A408		Placard, "Brake Engaged"		1
18	305389		Line, Brk, Mico Lock, .25 x 10"	C	1
19	305390		Line, Brk, Mico Lock, .25, 90D	C	1
20	305391		Line, Brk, Mico Lock, .25, 90D	C	1
21	305711		Ftg, Hyd, M/F, Br	B	2
22	F100708		Nut, Inv Flr, 1/4 T	B	2
23	NW034716		Spacer .63 O.D. x .38L x .13W	B	1

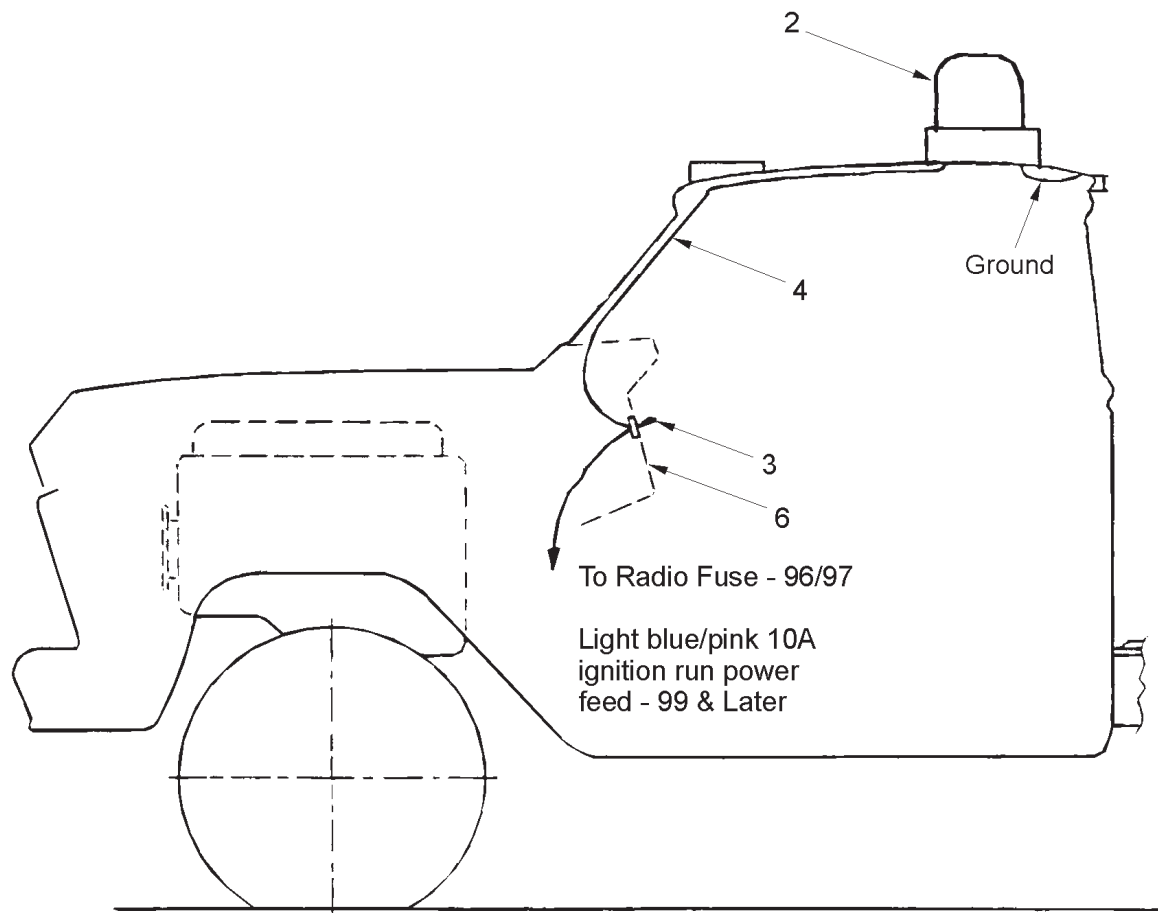
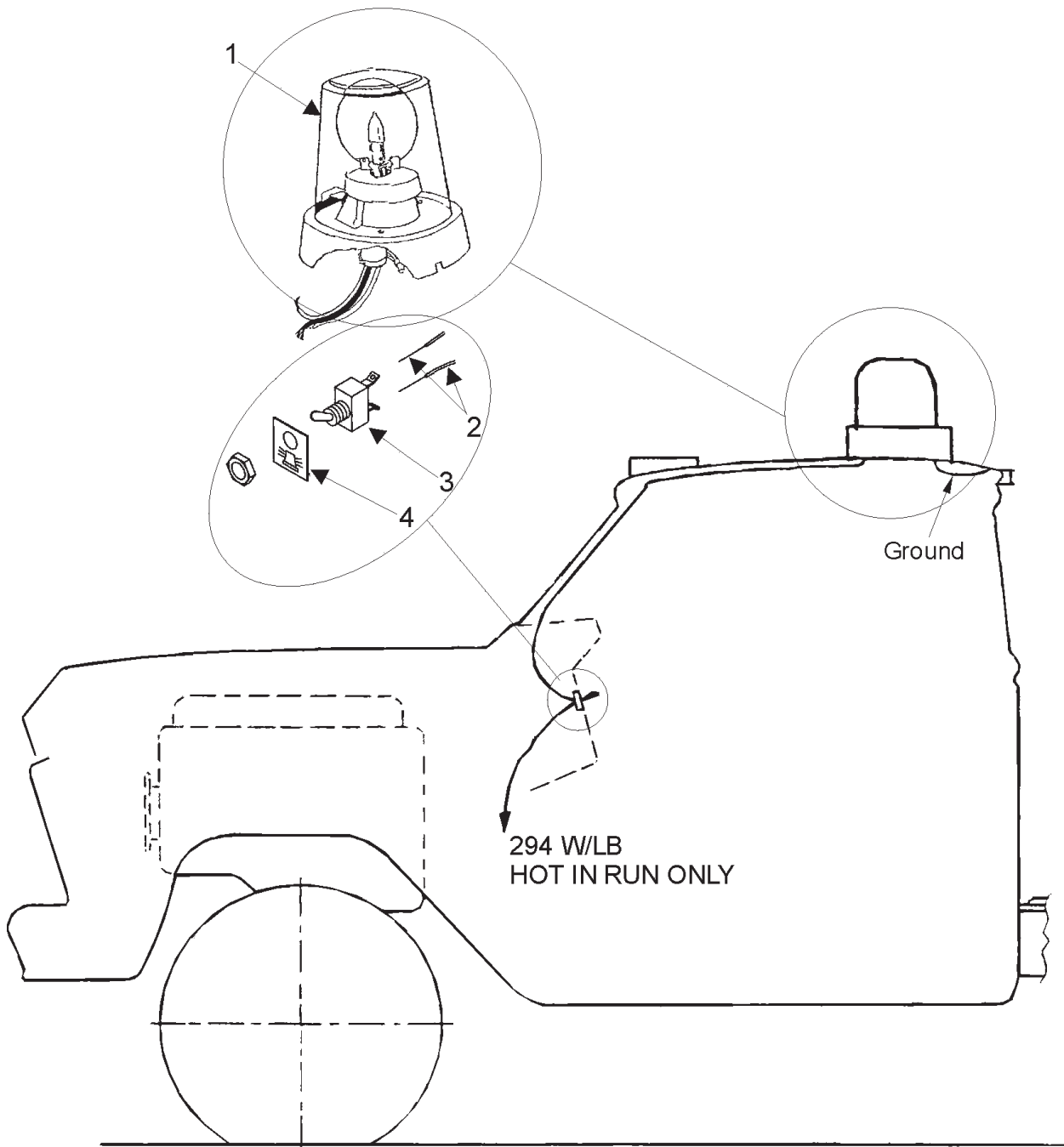


FIGURE 24.
BEACON, ROTATING, AMBER, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
24-	8807		Beacon, Rotating, Amber, Option		Ref
2	2.3911	Amber RB11-12V	Rotating Light (10402)		1
3	2.1031	8801-K22	Toggle Switch, Beacon On-Off (15605)		1
4	2.1532		Wire, 14 Ga.		192"
6	562A518		Placard, Beacon On/Off		1



**FIGURE 25.
FLASHING AMBER BEACON**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
25-	305259		Flashing Amber Beacon	B	Ref
1	305260		Light, Beacon, Flash, Amber		1
2	2.1532		Wire 14 GA Black (30 inches each)		2
3	2.1031		Switch, Toggle		1
4	562A518		Placard, Beacon, On.Off		1

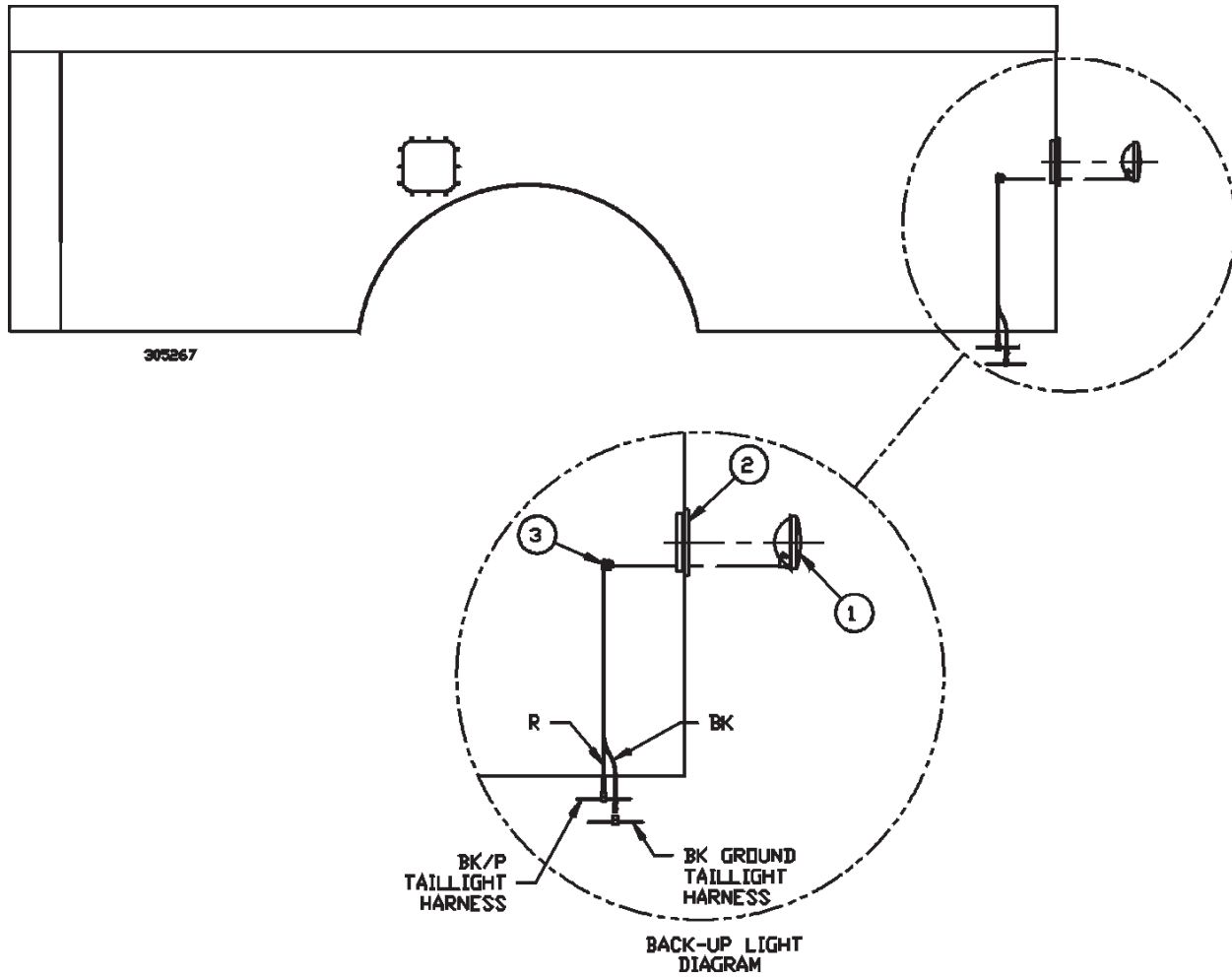


FIGURE 26.
LIGHTS, BACK-UP, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
26-	305267		Lights, Back-up, Option		Ref
1	NW035842		Light, Back-up, Clear, Sealed, 12V		2
	51227		Light, Backup, 4" round LED		2
2	NW035843		Grommet, Light, Tail & Back-up		2
3	NW035615		Pigtail, Back-up Light		2

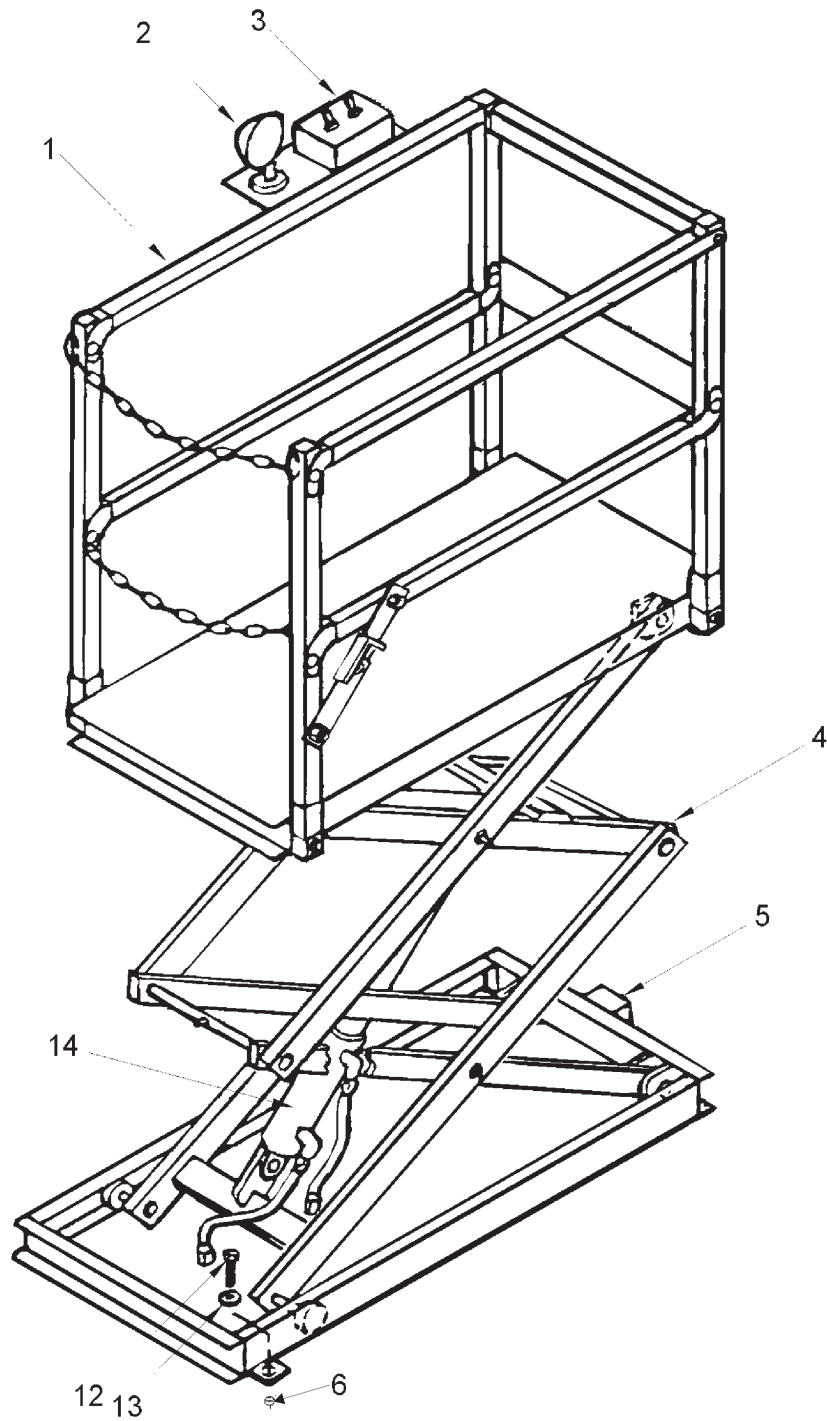


FIGURE 27.
PERSONNEL LIFT ASSEMBLY, TOP MOUNTED
1 OF 5

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
27-	8543		Personnel Lift Assembly, Top Mounted, 1 of 5		Ref
0	8883		Lift Assembly, HL 1076 (See Below)		
0	19765		Elec. Install. (See Pg 68)		
2	2.0435	538-000-CHR	Spotlight, Swivel, 12V/30W (46576)		Ref
3	8873		Control Station, Platform		Ref
5	8874		Control Box, Deck		Ref
6	F015922		Nut, Lock, 3/8-16		4
12	F100331		HHCS, 3/8-16x x 2.00		4
13	F009665		Washer, Lock, 3/8		4
14	8444		Hydraulic Installation (See Pg 70)		Ref
NS	3.1075		Clamp, Adel, #8		10
NS	562A339		Placard, "Max Load 500 Lbs"		1

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
27-	8883		Lift Assembly, HL 1076		1
1	8881		Handrail Assembly (See Pg 64)		Ref
4	9392		Lift Scissors Assembly (See Pg 66)		Ref
NS	562A339		Placard, "Max Load 500 Lbs" (See Pg 50)		1
NS	562A206		Placard, Pump On/Off (See Pg 50)		1
NS	18024		Ftg, Hyd, Mod		1
NS	3.1926		Ftg, Hyd, El 06MJ-08MP90		1
NS	1.1877		Plug, 7/8 Hole		1
NS	562A181		Placard, Lift Up/Down		1
NS	F016765		RHMS 10-32 X 3/4 ZP		7

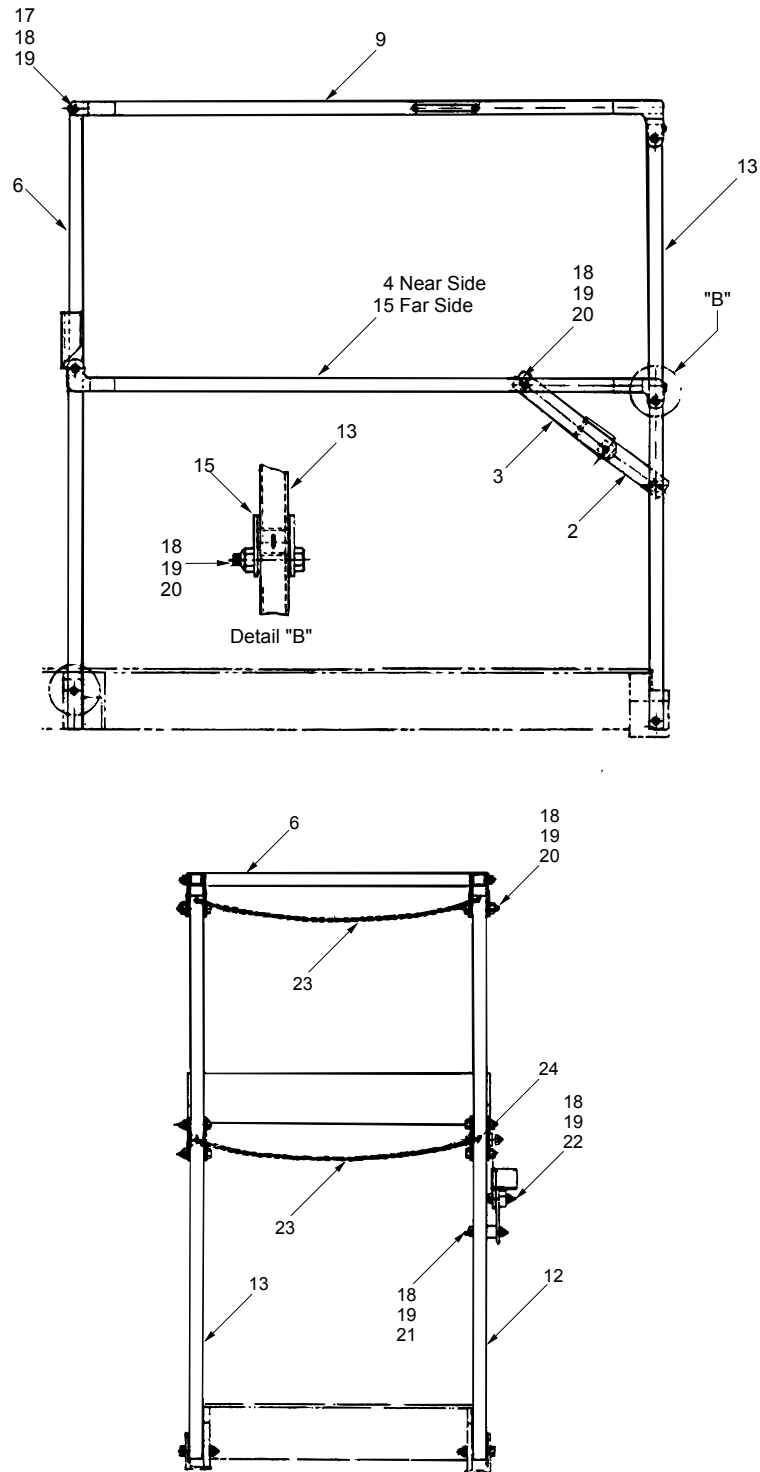


FIGURE 27.
PERSONNEL LIFT, TOP MOUNTED, HADRAIL ASSY
2 OF 5

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
27-	8881		Personnel Lift, Top Mounted, Handrail Assembly, 2 of 5		Ref
0	8543		Personnel Lift Assembly, Option		Ref
2	8775		Latch Arm, Lower		1
3	8778		Latch Arm, Upper		1
4	8779		Midrail, Latch Side		1
6	8782		Handrail, Stanchion Weldment		1
8	8785		Top Rail, LH		1
9	8790		Top Rail, RH		1
12	8791		Stanchion, Latch-side		1
13	8792		Stanchion		1
15	8793		Midrail		1
17	8794		Tie Rod		1
18	Comm		Nut, Lock, 3/8-16		11
19	Comm		Flat Washer, 3/8		28
20	Comm		HHCS, 3/8-16 x 2.00		9
21	Comm		HHCS, 3/8-16 x 2.75		3
22	Comm		HHCS, 3/8-16 x 1.75		1
23	1.2191		Security Chain, 3/16 x 24"		2
24	1.0736		Swivel Eye Snap, Brass		2

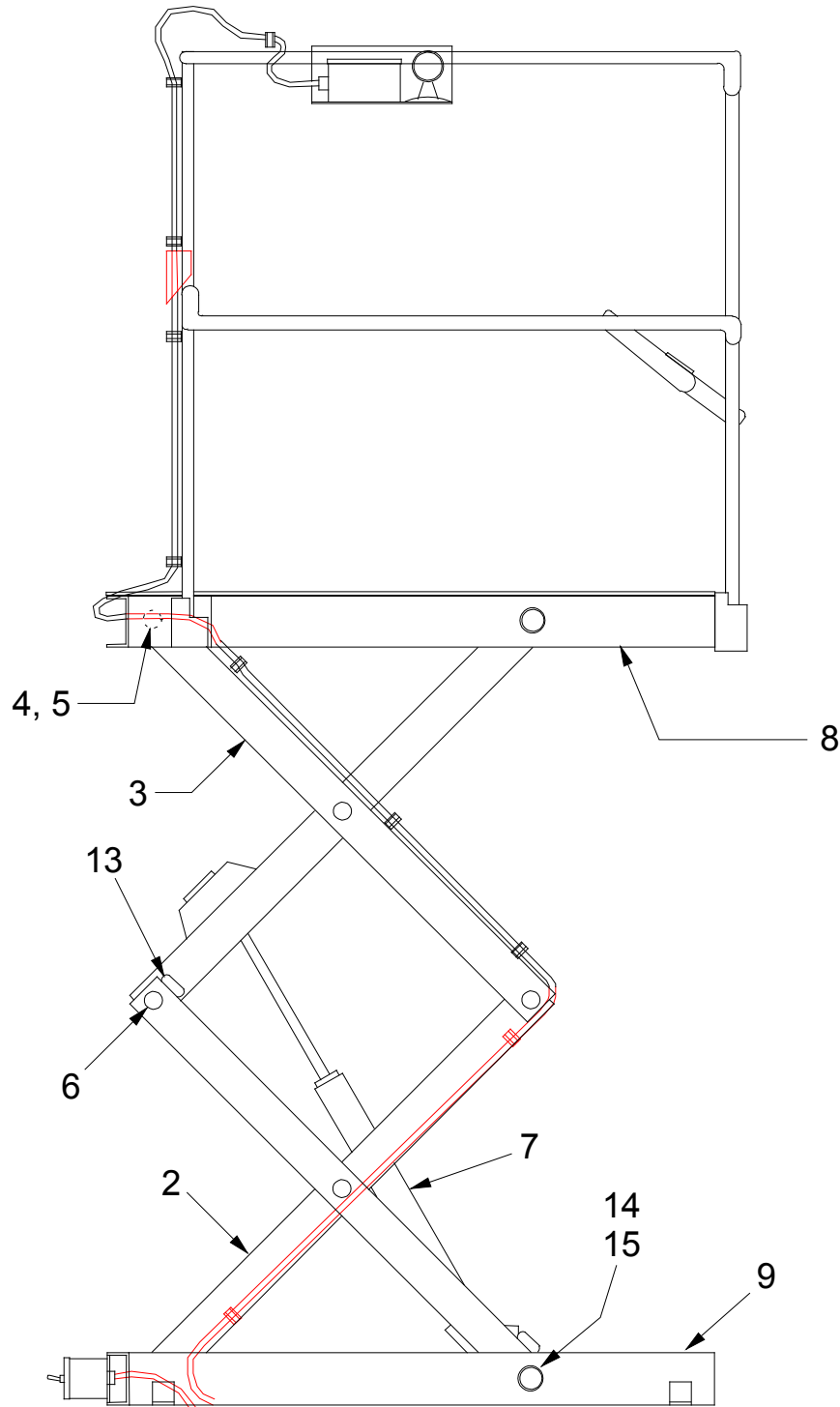


FIGURE 27.
PERSONNEL LIFT, TOP MOUNTED, LIFT SCISSORS ASSEMBLY
3 OF 5

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
27-	9392		Personnel Lift, Lift Scissors Assembly, Top Mounted, 3 of 5		Ref
0	8543		Personnel Lift Assembly, Option		Ref
2	9417		Lower Scissor Sub Assy.		1
3	9418		Upper Scissor Sub Assy		1
4	9395		Shaft		4
5	Comm		Cotter Pin, Std 3/16 x 2		4
6	9401		Shaft Assy, Long		2
7	1.8388	30TR16	Hydraulic Cylinder, Lift (Lion)		1
	30211	RK30TR	Kit, Seal		A/R
8	9409		Top Platform, Weldment		1
9	9415		Bottom Platform, Weldment		1
12	Comm		Grease Fitting, 3/16		14
13	1.7497	9597K31	Bumper (39428)		4
14	3.0295		Washer, Flat, 1.00		8
15	9394		Roller		4

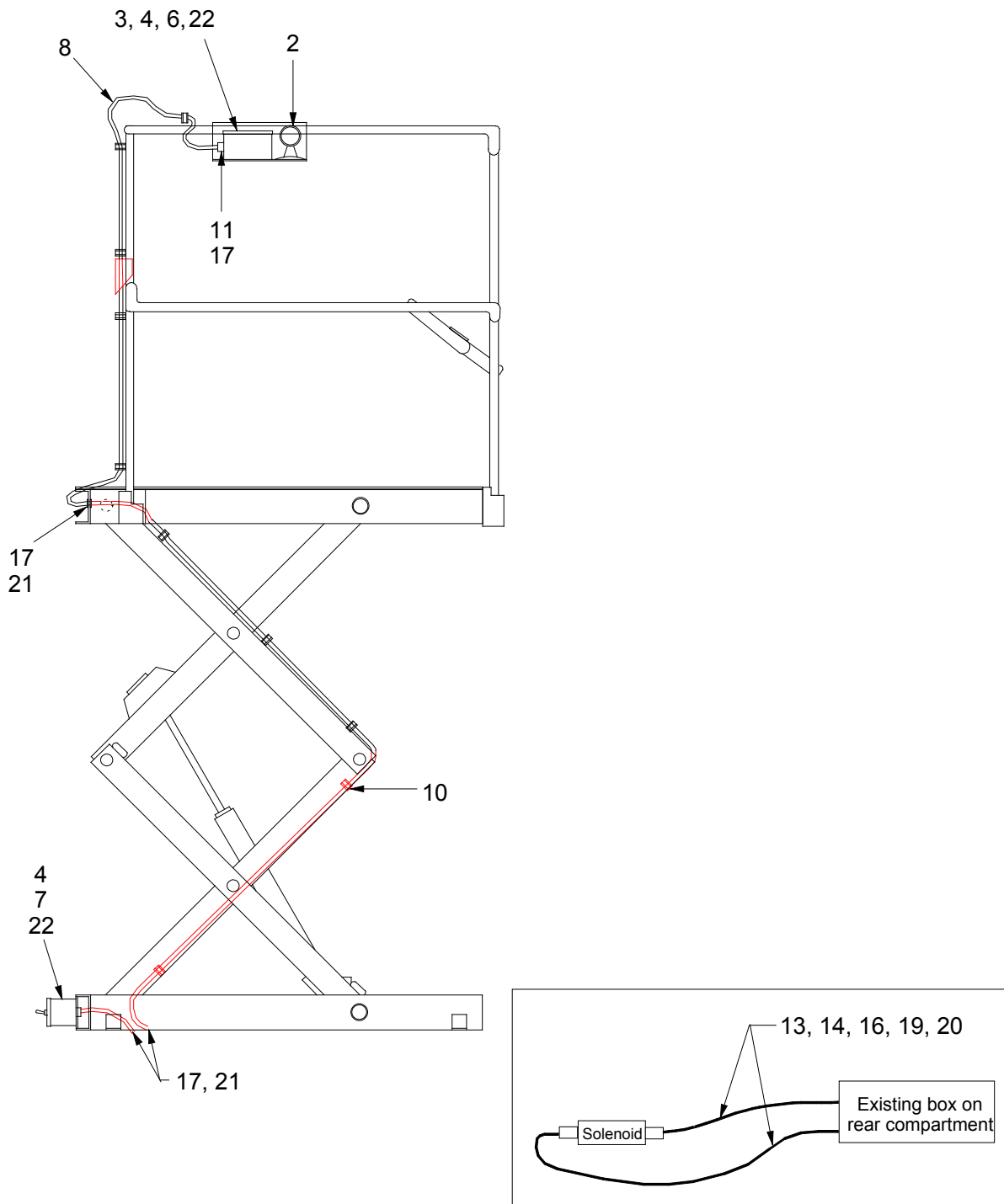


FIGURE 27.
PERSONNEL LIFT, TOP MOUNTED, ELECTRICAL ASSEMBLY
4 OF 5

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
27-	19765		Personnel Lift, Top Mounted, Electrical Assembly, 4 of 5		Ref
0	8543		Personnel Lift Assembly, Option		Ref
2	2.0435	538-000	Spotlight, Swivel, 12V/30W (46576)		1
3	2.3012	2TL1-7	Switch, Toggle, 3-pos., Momentary (91929)		1
4	2.1991	*1TL1-6	Switch, Toggle, SPNO, Momentary (91929)		2
6	8873		Control Box, Platform (Modified)		1
7	8874		Control Box, Deck (Modified)		1
8	2.2576		Cable, S.O., 16/5 X 25 FT.		1
10	3.1075	DG8	Clamp, 1/2" (83930)		8
11	2.0180	CG-5050	Connector, Cable (03743)		9
13	2.3231		Connector, Ell, 90 Degree		4
14	2.2306		Conduit, Flex, 3/8" X 5 Ft		1
16	2.0215		Connector, 3/8"		2
17	2.3442		Nut, Electrical Sealing, 1/2"		9
19	2.1532		Wire, Black, #14 AWG		10'
20	2.1533		Wire, Black, #14 AWG		12'
21	2.3467	CN-50	Nipple, Bushed Elec, 1/2" (03743)		3
22	2.3889	DC4	Compound, Dielectric, Med. Consist. (94499)		A/R

* Standard footswitch is removed and replaced with Item 4 when lift option is used.

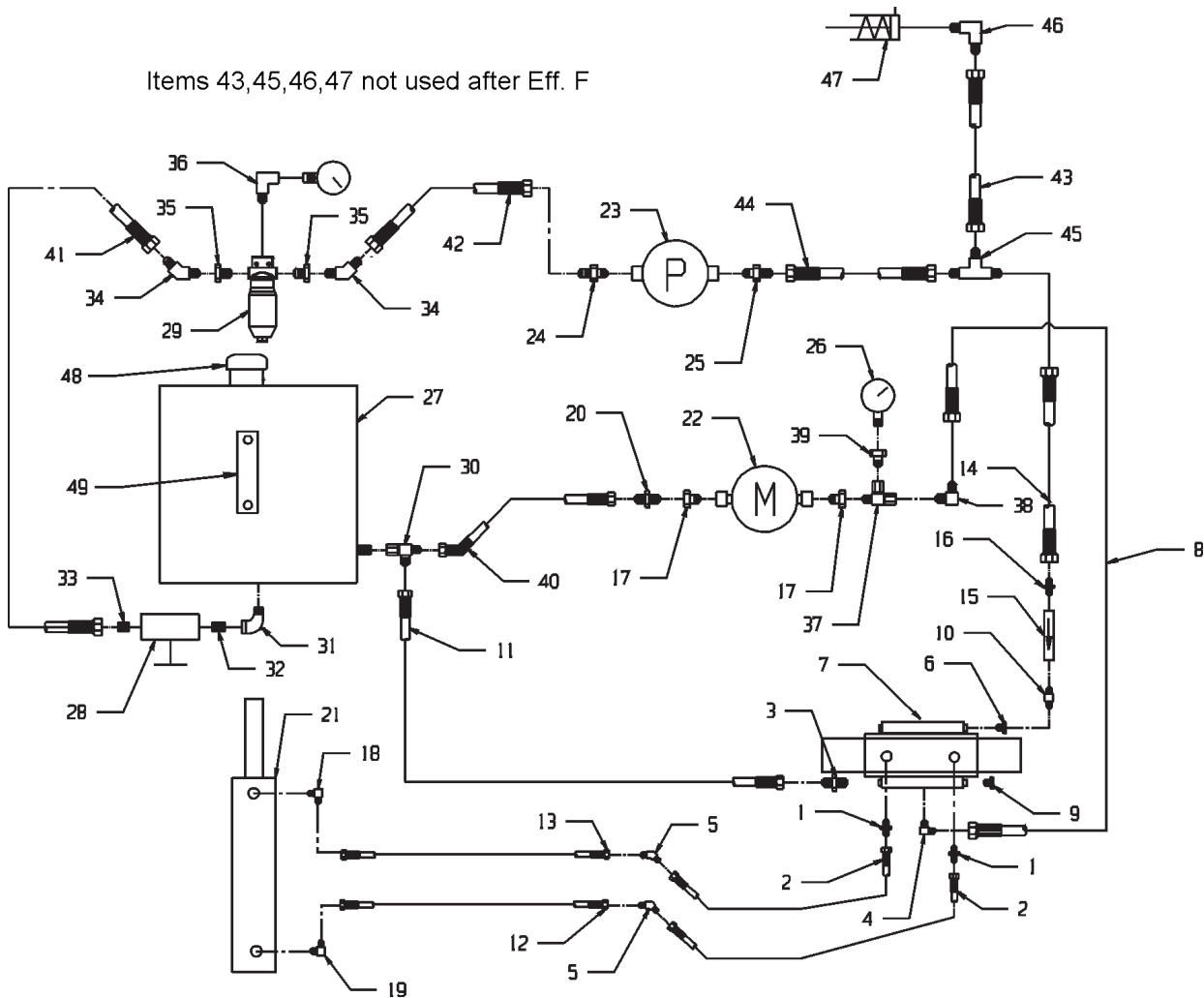


FIGURE 27.
HYDRAULIC INSTALLATION W/ REAR TOP MOUNTED PERSONNEL LIFT
5 OF 5

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
27-	8444		Hydraulic Installation w/ Rear Top Mounted Personnel Lift, 5 of 5		Ref
1	3.2518		Ftg, Hyd, 06MJ-06MB		2
2	8796.2		Hose Assembly, #6B, 36.5"		2
3	201048		Ftg, Hyd, 08MJ-06MB		1
4	3.2934		Ftg, Hyd, Ell, 08MJ-06MB		1
5	3.2145		Ftg, Hyd, Bkhd, Ell, 06MJ		2
6	303249		Ftg, Hyd, 06MB-08FJX		1
7	1.7935		Valve, Solenoid, Drctio		1
8	8946.41		Hose Assembly, #8M, 60.7"		1
9	3.2625		Ftg, Hyd, Plug, 06MB		1
10	3.1573		Ftg, Hyd, 06MJ-08MP		1
11	8946.3		Hose Assembly, #8, 20.72"		1
12	8945.11		Hose Assembly, #6M, 28.64"		1
13	8945.60		Hose Assembly, #6M, 31.64"		1
14	8946.38		Hose Assembly, #8M, 237.7"		1
15	1.8154		Valve, Check		1
16	3.1215		Ftg, Hyd, 08, Use 10087		1
17	3.0241		Ftg, Hyd, 12MP-08FP		Ref
18	3.1564		Ftg, Hyd, Ell, 06MJ-06MP90		Ref
19	18024		Ftg, Hyd, Mod, (3.1926/3.2752)		Ref
20	3.1575		Ftg, Hyd, 08MJ-08MP		Ref
21	1.8388		Cylinder, 3B x 165 x 1.25R		Ref
22	1.4191		Motor, Hyd		Ref
23	303726		Pump, Hyd, Danfoss, Side Ports 77		Ref
24	3.2875		Ftg, Hyd, 16MJ-12MB		Ref
25	202077		Ftg, Hydr, Ell, 08MJ-10MB45		Ref
26	1.0474		Gauge, Oil Pressure, 0-3000 PSI		Ref
27	8197		Reservoir, Hyd, 15Ga		Ref
28	1.7146		Valve, Gate, 1 NPT		Ref
29	1.5877		Filter, Hyd, 100 Mesh		Ref
	1.2874		Filter Element		Ref
30	3.2172		Ftg, Hyd, Tee, 08MJ-08MP-08MJ		Ref
31	3.0889		Ftg, Pipe, Ell, 16MP-16FP90		Ref
32	3.0935		Nipple, 1" NPT		Ref
33	3.1540		Ftg, Hyd, 16MJ-16FP90		Ref
34	3.1542		Ftg, Hyd, Ell, 16MJ-16MP45		Ref
35	3.1385		Ftg, Hyd, 20MP-16FP		Ref
	F017385		Ftg, P, 24MP-16FPML		Ref
36	3.2687		Ftg, Hyd, El, M/F, BR		Ref
37	3.1423		Ftg, Hyd, Tee, 08FP-08MP		Ref
38	3.1566		Ftg, Hyd, Ell, 08MJ-08MP90		Ref
39	3.0235		Ftg, Hyd, 08MP-04FP		Ref
40	8797.10		Hose Assembly, #8, 54.8" ST/45		Ref
41	10384.31		Hose Assembly, #16L, 83.00" ST/ST		Ref
42	10384.33		Hose Assembly, #16L, 180" ST/ST		Ref
43	8945.21		Hose Assembly, #16M, 32.64" ST/ST		Ref
44	8797.56		Hose Assembly, #8M, 22.1" C		Ref
45	3.1840		Ftg, Hyd, Tee, 08, Use 203848		Ref
46	3.1940		Ftg, Hyd, Ell, 06MJ-02MP90		Ref
47	18404		Cylinder 0.563B x15 x .25R		Ref
48	1.0202		Cap, Oil Fill		1
49	1.8110		Gauge, Sight, 3/8 NPT		1

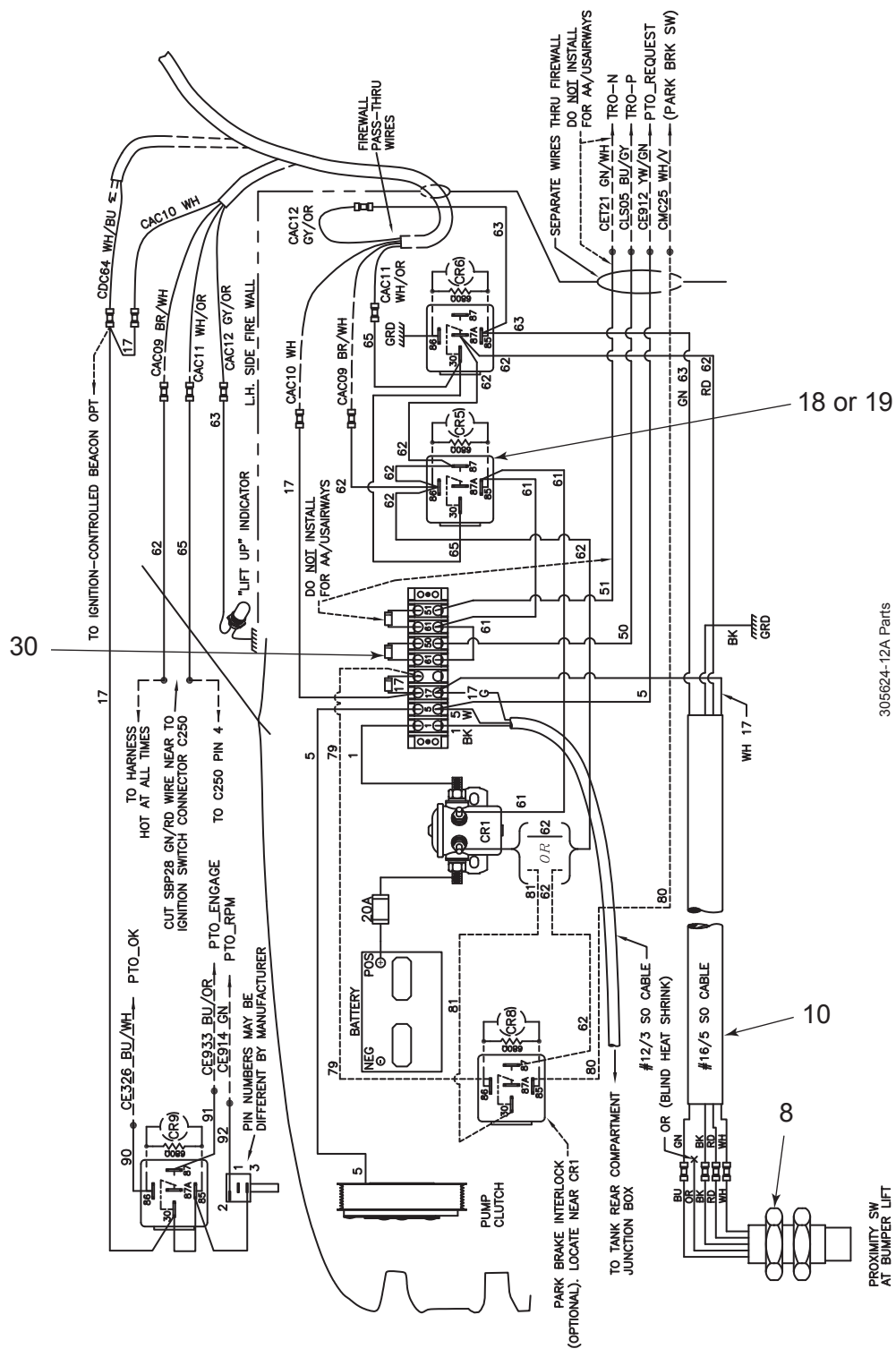
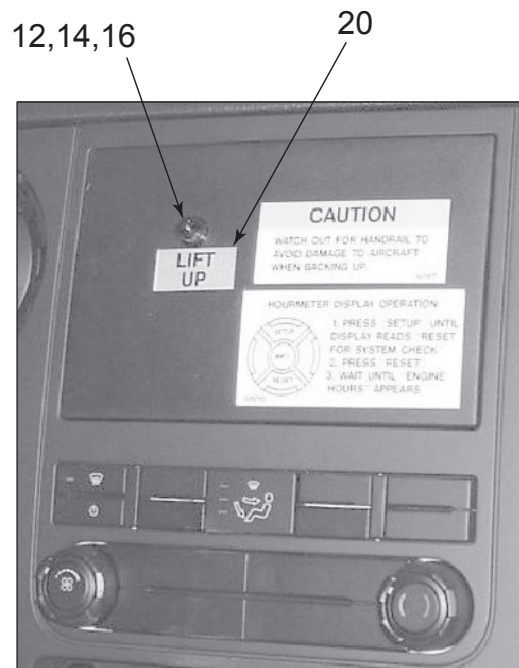


FIGURE 28.
LIFT, REAR BUMPER OPTION, ELECTRIC INSTALLATION
1 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, Electric Installation, 1 of 10		Ref
0	305624		Electric Installation, 1 of 2		Ref
8	304160		Switch, Prox, SPDT Relay Output		1
10	2.2576		Wire 16/5	F	336"
	2.3045		Wire 16/4 SO	E	336"
12	2.3008		Lens, Red		1
14	2.3511		Holder, Lamp with Nut & Washer		1
16	2.3002		Bulb, #382, Indicator, 14V		1
18	2.3648		Relay, 12VDC, SPDT, 15A, (2011-2014) (Use SB502 for repairs)		1
19	309961		Relay, 12VDC, SPDT, 40A, (2014+)		1
20	562A295		Placard, Lift Up		1
30	2.3093		Diode, Axial Lead, 3 Amp, 200V	F E	2 1



View of Dash

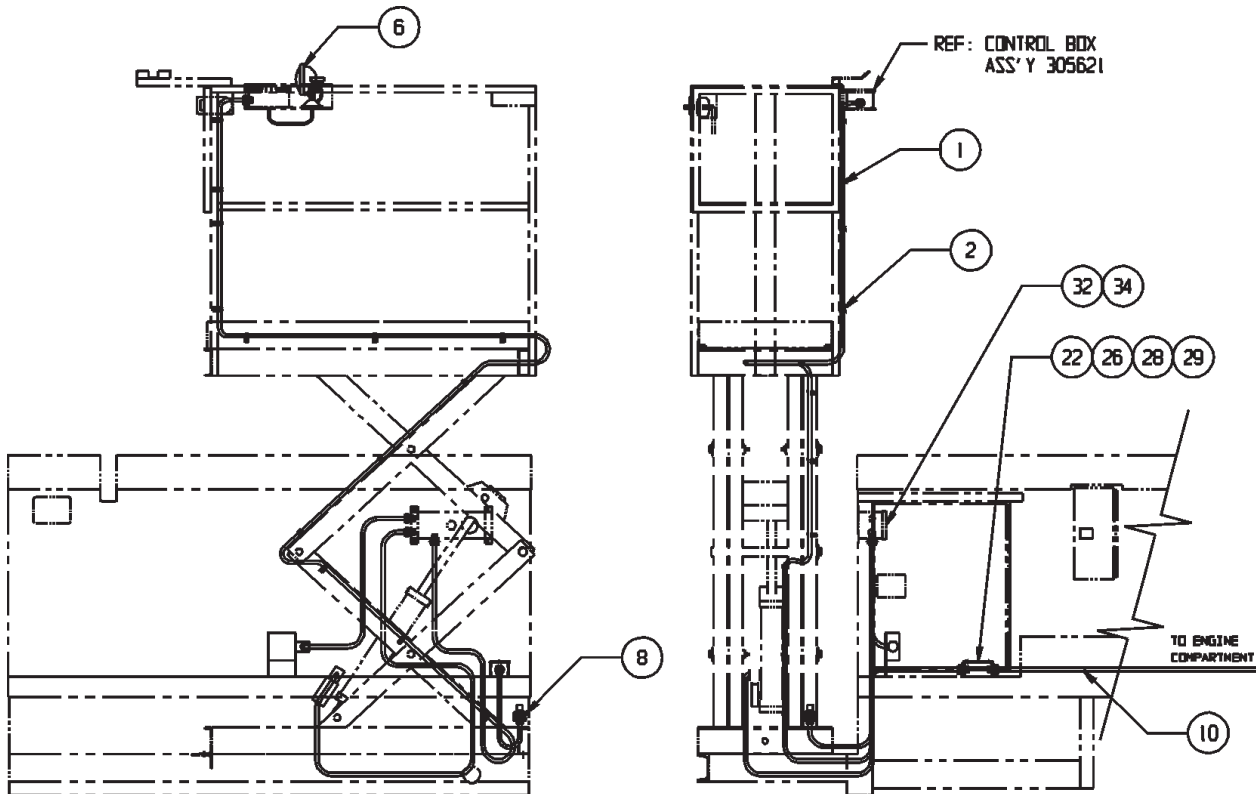


FIGURE 28.
LIFT, REAR BUMPER OPTION, ELECTRIC INSTALLATION
2 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, Electric Installation, 2 of 10		Ref
0-	305624		Electric Installation, 2 of 2		Ref
1	2.3826		Wire 16/8 SO Hard Serv		312"
2	3.1076		Clamp #10		13
6	2.0435		Light, Swivel Spot		1
8	304160		Switch, Prox, SPDT Relay Output		1
10	2.2576		Wire 16/5 SO Hard Service	F	336"
	2.3045		Wire 16/4 SO	E	336"
22	307621		Enclosure Modified		1
	2.3431		Box, Junction, 4 x 2.5 x 2		1
26	2.3442		Nut, 1/2 Elec Seal		2
28	2.0176		Connector, 1/2" Hub		1
29	2.0177		Connector, Cord		1
32	2.3012		Switch, Toggle		1
34	562A181		Placard, Lift, Up/Down		1

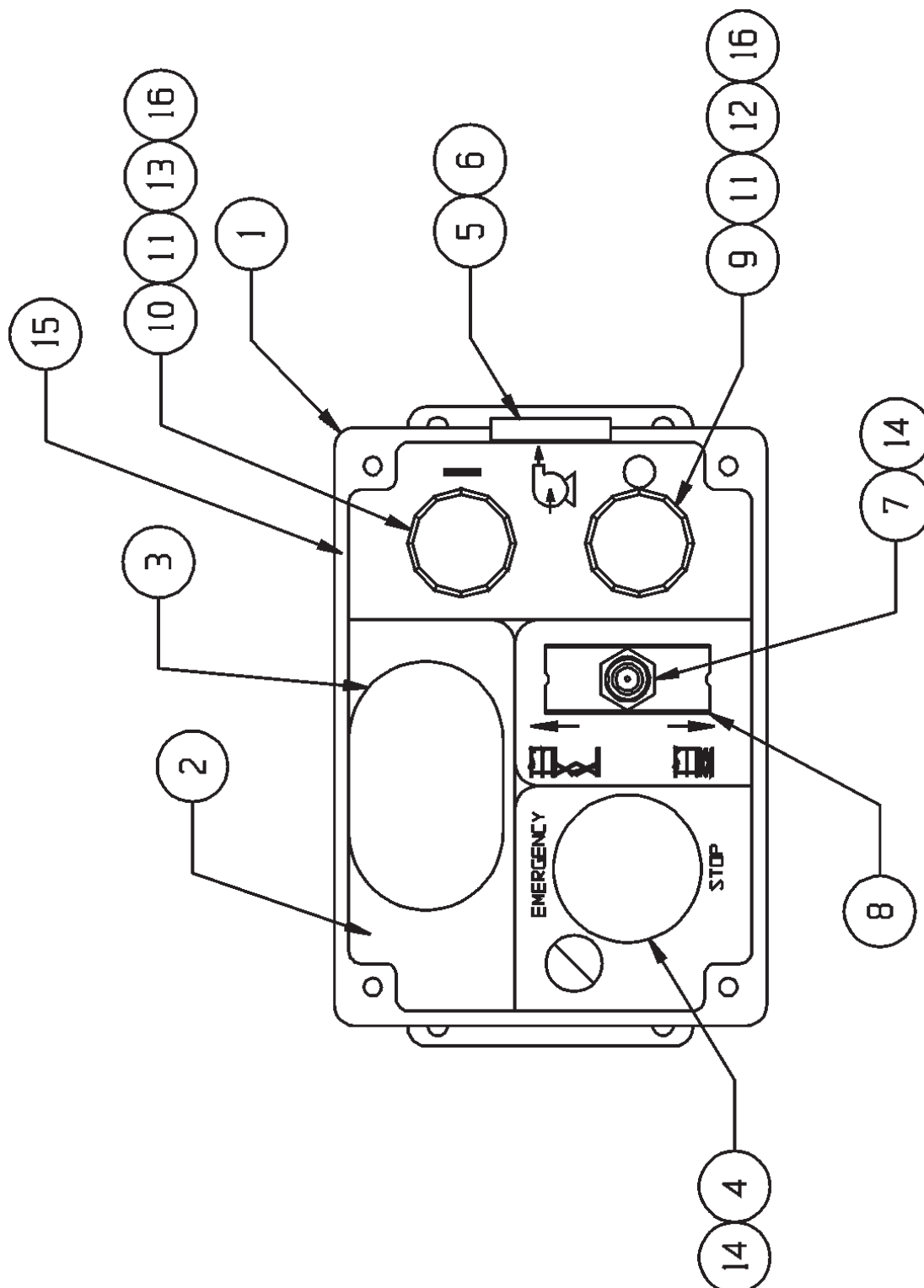


FIGURE 28.
LIFT, REAR BUMPER OPTION, CONTROL BOX ASSY
 3 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, Control Box Assembly, 3 of 10		Ref
0-	305621		Control Box Assembly		Ref
1	305496		Control Box, Rear Lift, 402		1
2	305497		Decal, Control Box, Lift, 402		1
3	301662		Light, 60121-3, Auxiliary, 12VDC		1
4	2.2821		Switch, Mush, Red, Maintenance, SPNC		1
5	2.0180		Connector, Cord 1/2" Hub		1
6	2.3442		Nut, 1/2 Electric Seal		1
7	2.3886		Switch, Toggle		1
8	2.3800		Guard, Switch		1
9	306386		Operator, Switch, P/B, Red, Momentary		1
10	306387		Operator, Switch, P/B, Green, Momentary		1
11	19782		Adapter, Push button Switch		1
12	2.3919		Switch, Ball Operated, N/C		1
13	2.3356		Switch, Ball Operated, N/O		1
14	2.3889		Grease, DI Electric, 5.3 oz. Tub		1
15	2.3936		Inhibitor, Corrosion, A-HCI-1DV		1
16	306388		Shroud, Switch, Clear, P/B, Flush		2

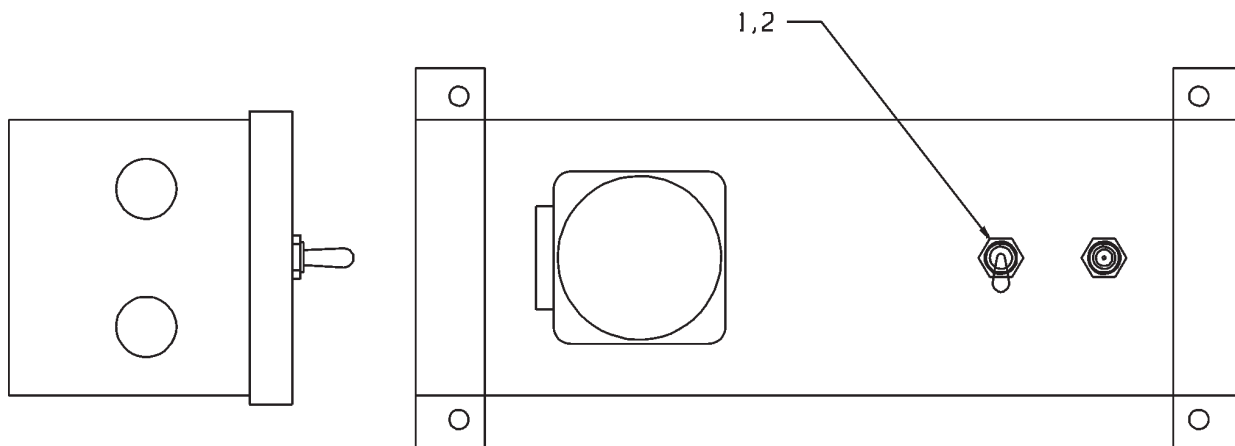


FIGURE 28.
LIFT, REAR BUMPER OPTION, GROUND CONTROL BOX
4 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, Ground Control Box, 4 of 10		Ref
1	2.3012		Switch, Toggle		1
2	562A181		Placard, Lift UP/DOWN		1

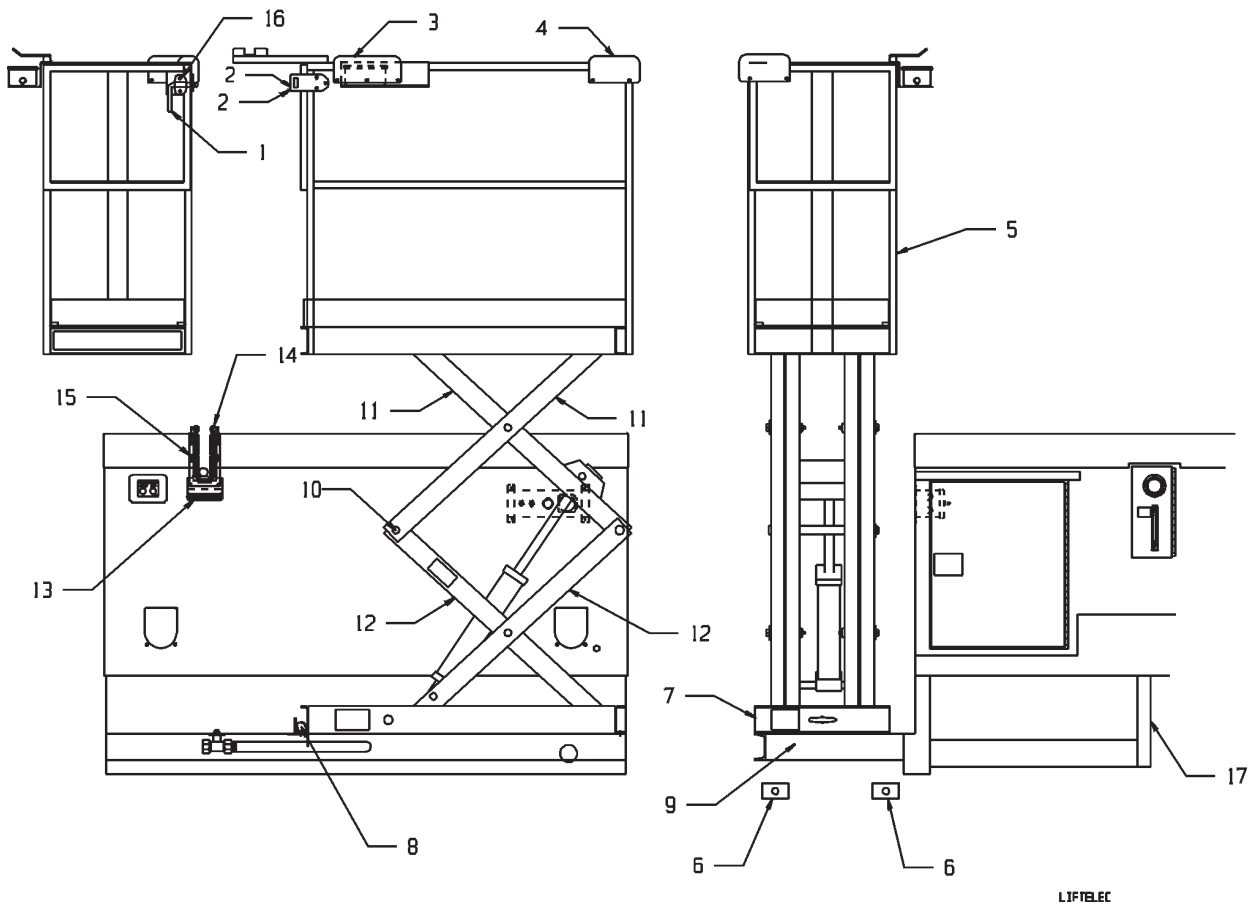


FIGURE 28.
LIFT, REAR BUMPER OPTION, BUMPER
5 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, 5 of 10		Ref
0-			Bumper		Ref
1	305498		Latch Handle, Gate, Western		1
2	305492		Plate, Latch		1
3	305535		Bumper, Edge, (Flite-Fend)		1
4	302751		Bumper, Corner, (Flite-Fend)		1
5	305495		Platform Weldment, Rear Lift, 402		1
6	302855		Plate, Lift Clamp		2
7	305540		Base Weldment, Rear Lift, 770		1
8	303182		Pipe Weldment, Maint		1
9	305576		Bumper Weldment, Rear w/Lift, 402		1
10	9401		Shaft Weldment		1
11	9418		Upper Scissors Subassembly		1
12	9417		Lower Scissors Subassembly		1
13	305611		Guide Roller Weldment, Inner, 402		1
14	305612		Guide Roller Weldment, Upper, 402		1
15	305613		Guide Roller Weldment, Lower, 402		1
16	306162		Latch, Bearing Cap		1
17	305577		Angle, Bumper Mtg		2
NS	1.7965		Reflector, Yellow, 3" OD		3
NS	2.3695		Wire, 16/2 SO 600V		96"
NS	37640		Conn, EI, W-Pack, Body		2
NS	37308		Conn, EI, W-Pack, Skt		4
NS	37309		Conn, EI, W-Pack & 280 Seal		4

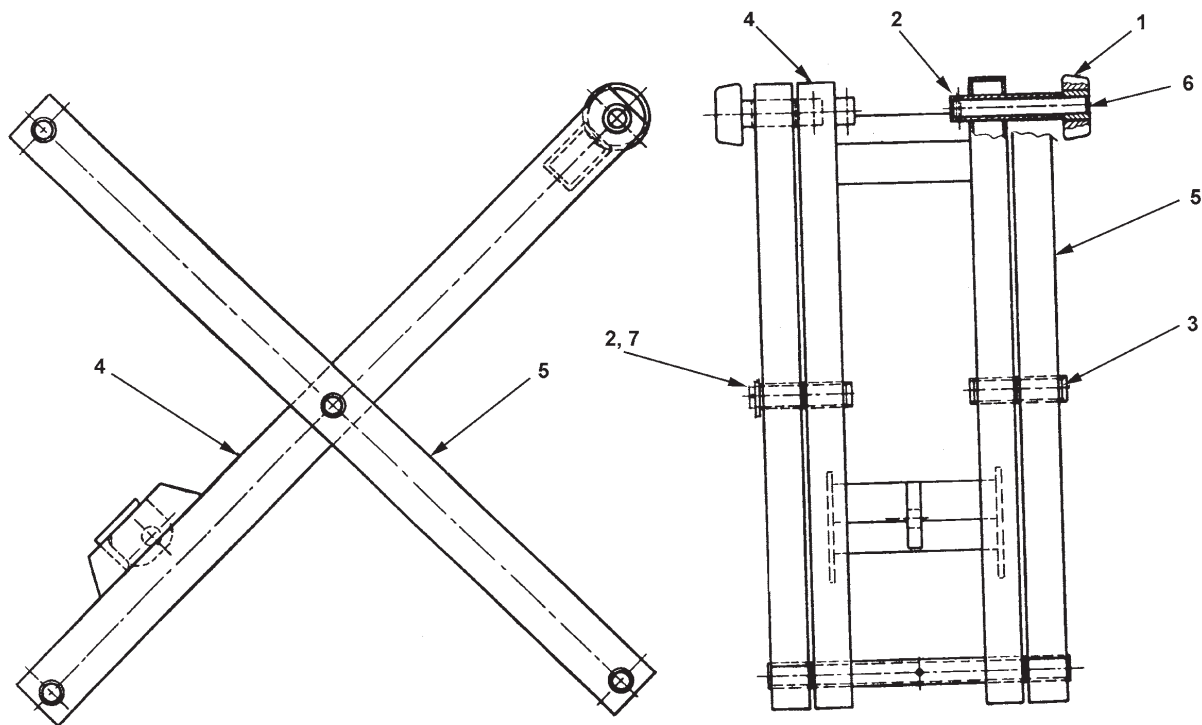


FIGURE 28.
LIFT, REAR BUMPER OPTION, UPPER SCISSORS SUB ASSEMBLY
6 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, Upper Scissors Sub Assembly, 6 of 10		Ref
0	9418		Upper Scissors Sub Assembly		Ref
1	9393		Roller w/ Bushing		2
2	Comm		Cotter Pin, 3/16 x 2-1/2		4
3	9396		Shaft Assembly (Short), 1" Diagram x 5.156		2
4	9402		Strut Weldment		1
5	9407		Arm Weldment		2
6	14413		Roller Shaft Top		2
7	3.1125		Flat Washer, 1 SAE		2

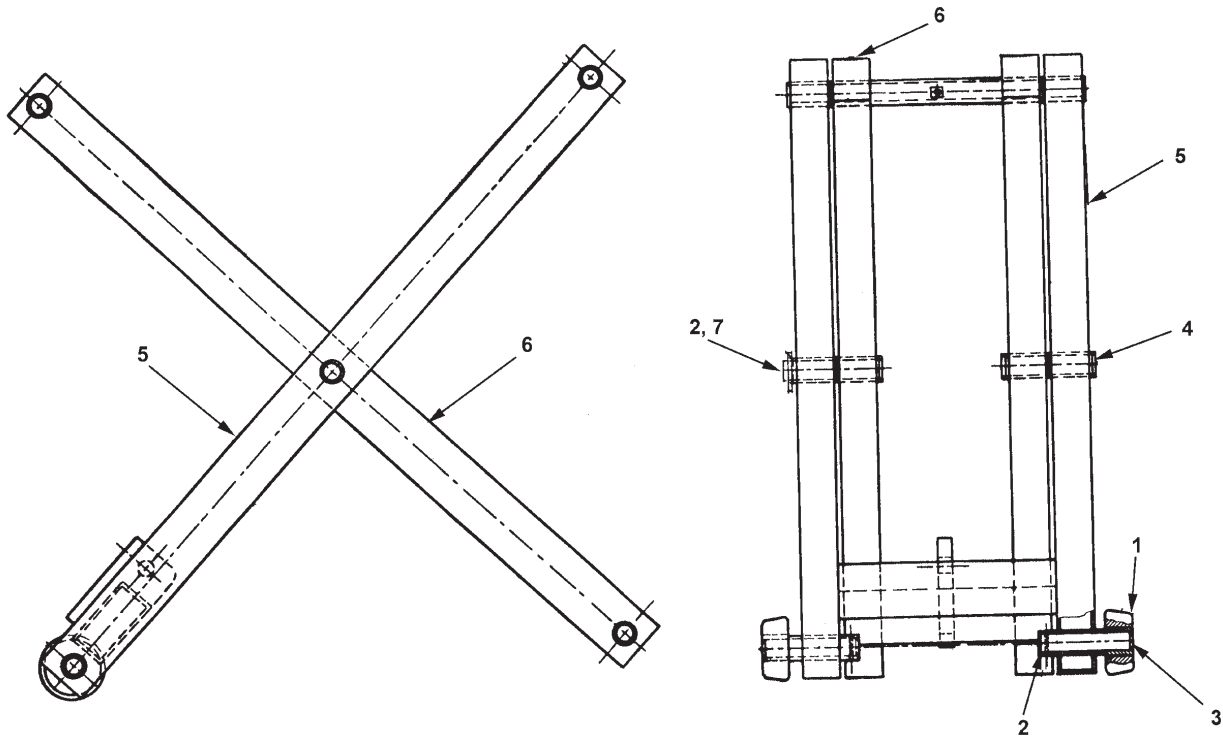


FIGURE 28.
LIFT, REAR BUMPER OPTION, LOWER SCISSORS SUB ASSEMBLY
7 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Lift, Rear Bumper Option, Lower Scissors Sub Assembly, 7 of 10		Ref
0-	9417		Lower Scissors Sub Assembly		Ref
1	9393		Roller w/Bushing		2
2	Comm		Cotter Pin, 3/16 x 2-1/2		4
3	14412		Roller Shaft Bottom		2
4	9396		Shaft Assembly (Short), 1" Diagram x 5.156		2
5	9398		Strut Weldment		1
6	9414		Strut Weldment		1
7	3.1125		Flat Washer 1 SAE		2

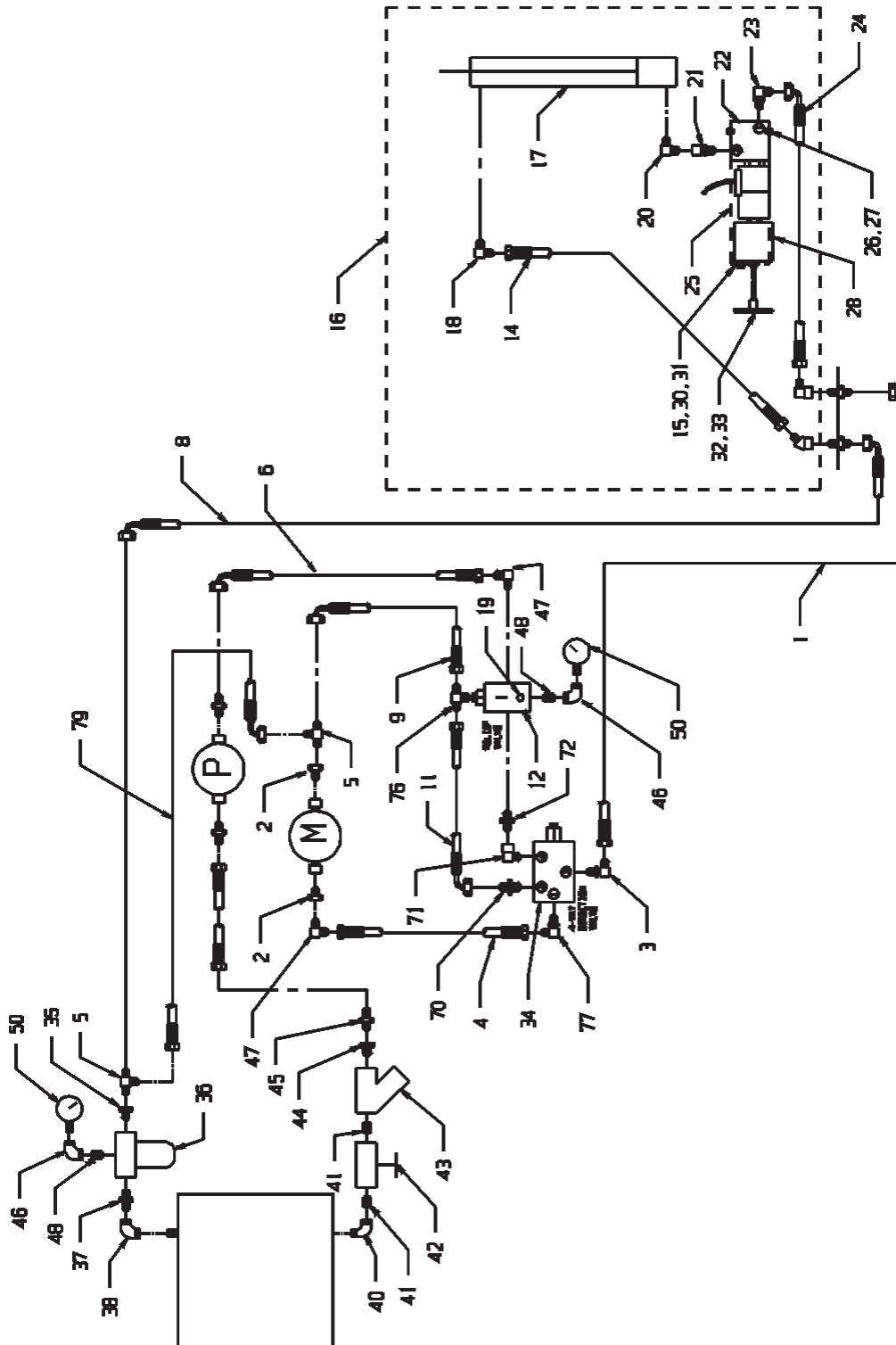


FIGURE 28.
HYDRAULIC INSTALLATION W/ REAR BUMPER MOUNTED LIFT
8 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Hydraulic Installation w/ Rear Bumper Mounted Lift, 8 of 10		Ref
0-	305539		Hydraulic Installation w/ Rear Lift, 1 of 2		Ref
1	8796.33		Hose Assembly, #6C, 88.4"		2
2	3.0241		Fitting, RB12MP-08FP		2
3	NW036560		Ftg, Hyd, Ell, 06MJ-08MB90		1
4	8797.6		Hose Assembly, #8C, 15.5"		1
5	3.2172		Tee, 08MJ-08MP-08MJ		2
6	Ref		Hose Assy, Press, (chassis-dependent)		Ref
8	8796.63		Hose Assembly, #6C, 68.9"		1
9	8797.27		Hose Assembly, #8C, 19.5"		1
11	8797.56		Hose Assembly, #8M, 22.1"		1
12	1.8450	RPEC-FAN	Cartridge, Valve, Relief (20695)		1
14	8945.60		Hose Assembly, #6, 31.64", ST/ST		1
15	3.3067		Cage Nut, 1/4-20		1
16	NW036518		Cylinder Assembly, Rear Lift		Ref
	305538		Cylinder Assembly, Rear Lift (see page 91)	B	Ref
17	1.8388		Cylinder, 3B x 16S x 1.50R		1
18	3.1926		Ftg, Hydraulic, Ell, 06MJ-08 MP90		1
19	3.2752		Plug, Socket Head,, 1/4NPT		1
20	305614		Ftg, Hydraulic, Mod		1
21	303249		Ftg, Hydraulic, 06MB-08FJX		1
22	305541	SV3820J6T N12DW	Valve, Sol, 2W2P, N/C, 12VD, Cable (V26020)		1
23	3.2878		Ftg, Hydraulic, Ell, 06MJ-06MB90		1
24	8796.8		Hose Assembly, #6, 32.93", ST/90		1
25	305594		Bracket Weldment, Cable Attach		1
26	305597		HHCS 1/4-20 x 2, GR5, ZP		2
27	F013588		Nut Lock 1/4-20 Nyl Insert		2
28	305596		Cover, Cable Attach		1
30	F100302		HHCS 1/4-20 x 1/2, GR5		1
31	F009535		LW 1/4 Reg		1
32	305598		Cable, Valve, Relief (20695)		1
33	305593		Coupling, Cable Core		1
34	305542	SV10408T N12DW	Valve, Directional SOL, 4W2P (20695)		1
	305713		Brkt, Valve, Mtg. (used to mount 305542)		1
35	3.0241		Ftg, Hyd, 12MP-08FP		3
36	1.0437		Filter, Hyd, Return, 3/4" NPT		1

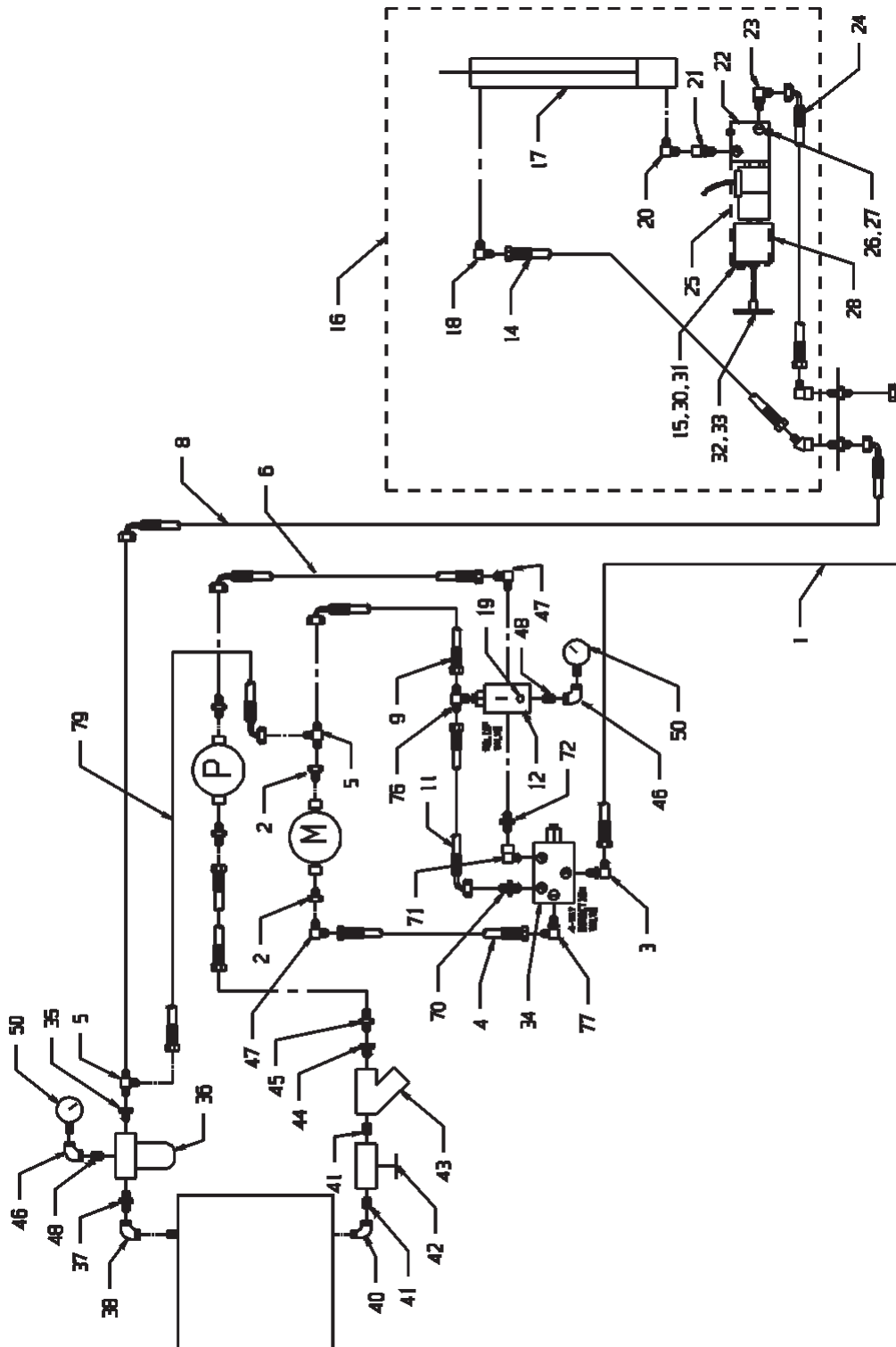


FIGURE 28.
HYDRAULIC INSTALLATION W/ REAR BUMPER MOUNTED LIFT
 9 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Hydraulic Installation w/ Rear Bumper Mounted Lift, 9 of 10		Ref
0-	305538		Cyl Asm, Rear Lift (see page 91)		Ref
	305539		Hydraulic Installation w/ Rear Lift, 2 of 2		Ref
37	150178		Ftg, Pipe, N, 12MP-12MP-2.5		1
38	3.0593		Ftg, Pipe, Ell, 12FP-12FP90		1
40	203843		Ftg, Hyd, Ell, 1-1/2 BMI, M/F		1
41	NW032845		Ftg, Pipe, N, 24MP-24MP		2
42	1.0890		Valve, Gate, 1-1/2 NPT, Brass		1
43	1.3368		Strainer, Y, 1-1/2 NPT		1
44	3.0566		Reducer, 1-1/2 X 1-1/4, Brass		1
45	203844		Ftg, Hyd, 16MJ-20MP		1
46	305754		Ftg, Hyd, Ell, 02FP-02FP90		2
47	3.1566		Ftg, 08MJ-08MP90		2
48	NW036518		Ftg, Pipe, N, .02MP-02MP-Close		2
50	1.9008		Gauge, Indicator, 0-25 PSI, 2"		2
	1.0474		Gauge, Indicator, 0-3000PSI	I	2
70	90413		Ftg, Hyd, 08MB-08MJ		1
71	1.8608		Ftg, Hyd, 08MB-08FP90		1
72	3.1416		Ftg, Hyd, 08MP-08MP		1
76	3.2475		Ftg, Hyd, Tee, 08MJ-08MJ-08MP		1
77	3.1380		Ftg, Hyd, 08MB-08MJ90		2
79	8797.27		Hose Assembly, #8M		1
	202089		Hose Assembly, #8M, 21.00", ST/90	I	1
80	1.8453		Manifold, Relief, 1/2 NPT	J	1
81	202074		Ftg, Hyd, 08MJ-10MB45	J	1
82	3.2961		Ftg, Hyd, 08MP-08MJ-12MB	J	1
83	3.2679		Ftg, Hyd, Tee, 08MJ-08FJX-08MJ	J	1
84	3.0248		Ftg, Hyd, 04MP-04FP90	J	1

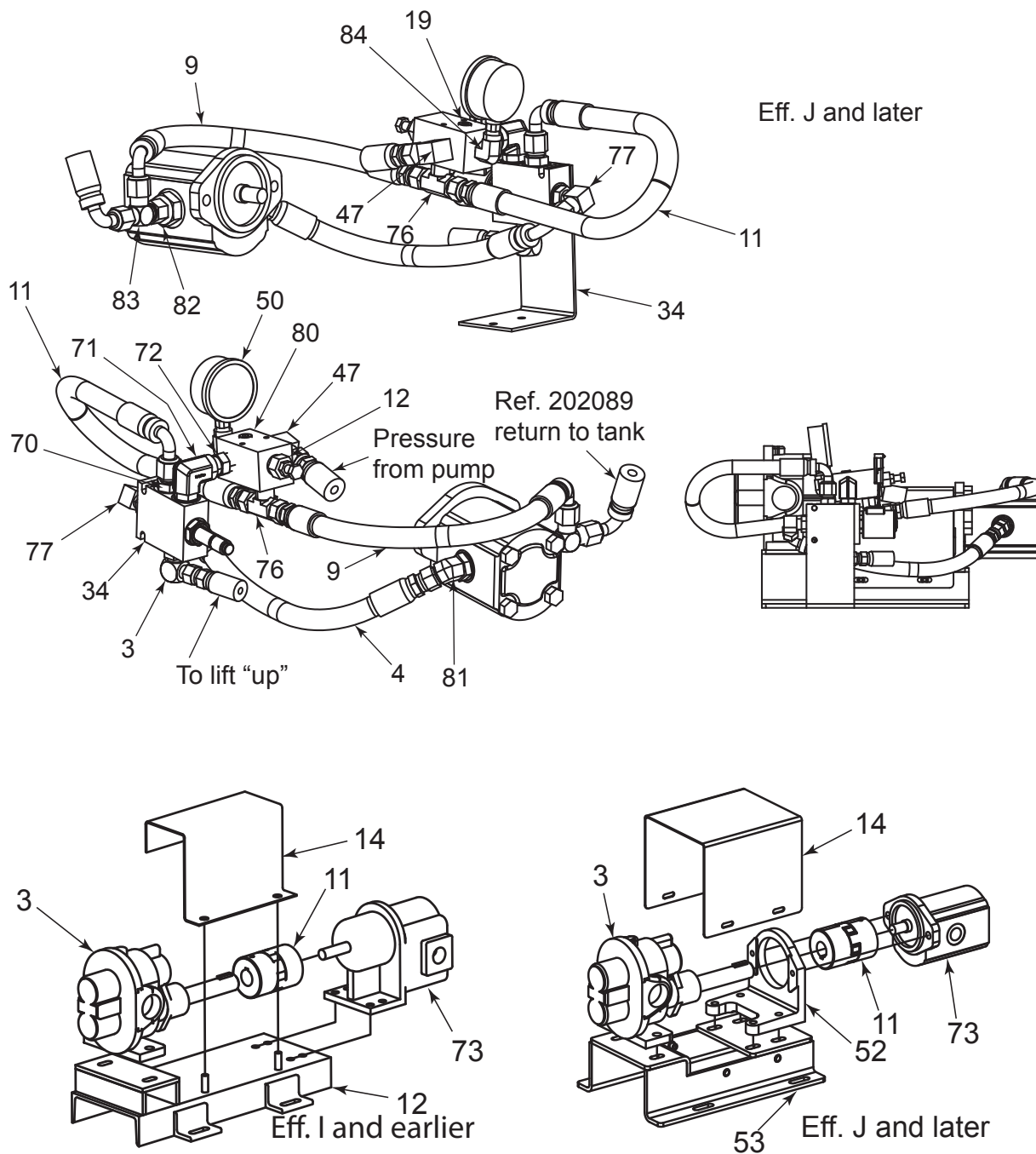
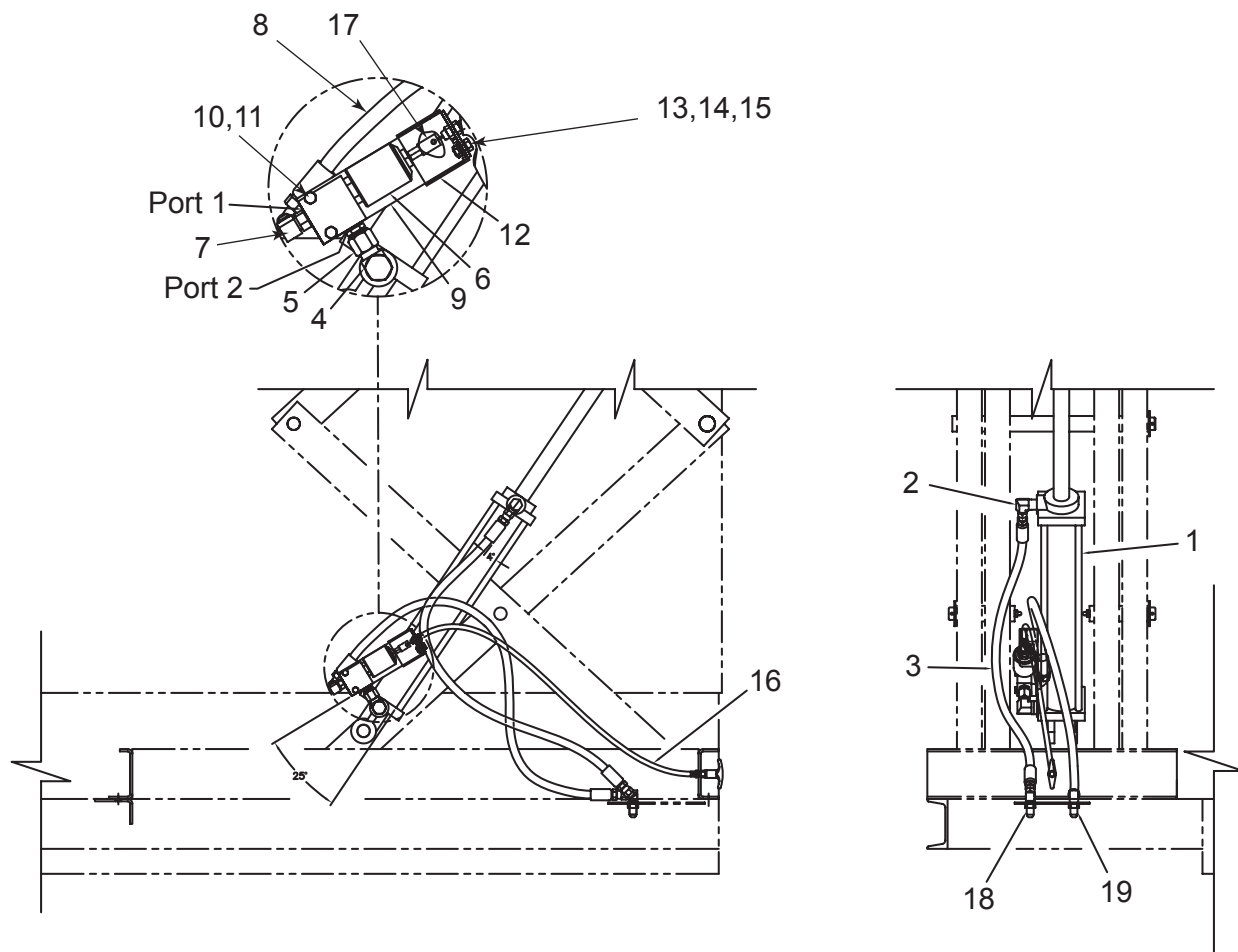


FIGURE 28.
HYDRAULIC INSTALLATION W/ REAR BUMPER MOUNTED LIFT
10 OF 10

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
28-	305449		Hydraulic Installation w/ Rear Bumper Mounted Lift, 9 of 10		Ref
3	1.3129	11510S5	Water Pump (44408) (1.3909 repair)		1
11	1.2189	L-100	Coupling, Flexible (75665)		1
12	8516		Base, Motor/Pump		1
14	302755		Guard, Shaft		1
	309955		Guard, Shaft	J	1
52	309947		Mount, Pump/Motor	J	1
53	309950		Base, Assy, Pump Drive	J	1
73	1.4193		Motor, Hyd.		1
	309946		Motor, Hyd, 1.61 CIR 5/8 Key, CCW	J	1



**FIGURE 29.
CYLINDER ASSEMBLY LIFT**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
29-	305538		Cylinder Assy. Rear Lift	B	Ref
1	1.8388		Cyl. 3" Bore x 16" Stroke x 1.25 Dia. Rod		1
2	3.1926		Ftg, Ell, 06MJ-08MP90		1
3	8945.60		Hose Assy, #6M, 31.64", ST/ST		1
4	3.1566		Ftg, Hyd, Ell, 08MJ-08MP90		1
5	303249		Ftg, Hyd, 06MB-08FJX		1
6	305541		Valve, Sol, 2W2P, N/C, 12VD		1
7	3.2878		Ftg, Hyd, Ell 06MJ-06MB90		1
8	8796.8		Hose Assy, #6M, 32.93", St/90		1
9	305594		Brkt, Wldmnt, Cable Attach		1
10	305597		HHCS, 1/4-20 x 2, Gr 5, ZP		2
11	F013588		Nyl Insert Lock Nut, 1/4-20		2
12	305596		Cover		1
13	3.3067		Gage Nut, 1/4-20		1
14	F100302		HHCS, 1/4-20 x 1/2, Gr 5		1
15	F009535		Lock Washer, 1/4 Reg.		1
16	305598		Valve Release Cable		1
17	305593		Cable Core Coupling		1
18	3.2145		Ftg, Hyd, BKHD, Ell, 06MJ-06MJ45		1
19	3.2006		Ftg, Hyd, BKHD, Ell, 06MJ-06MJ90		1

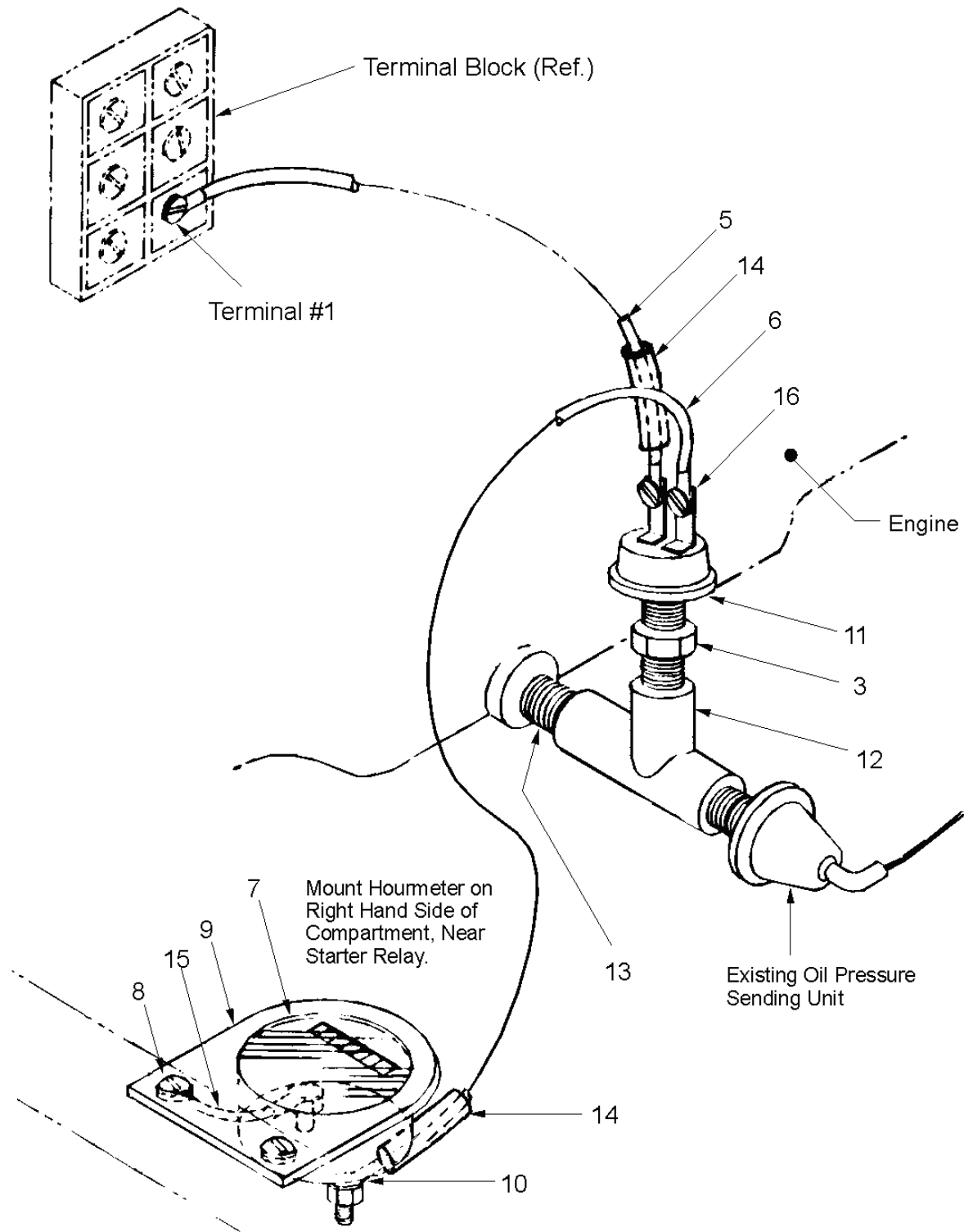
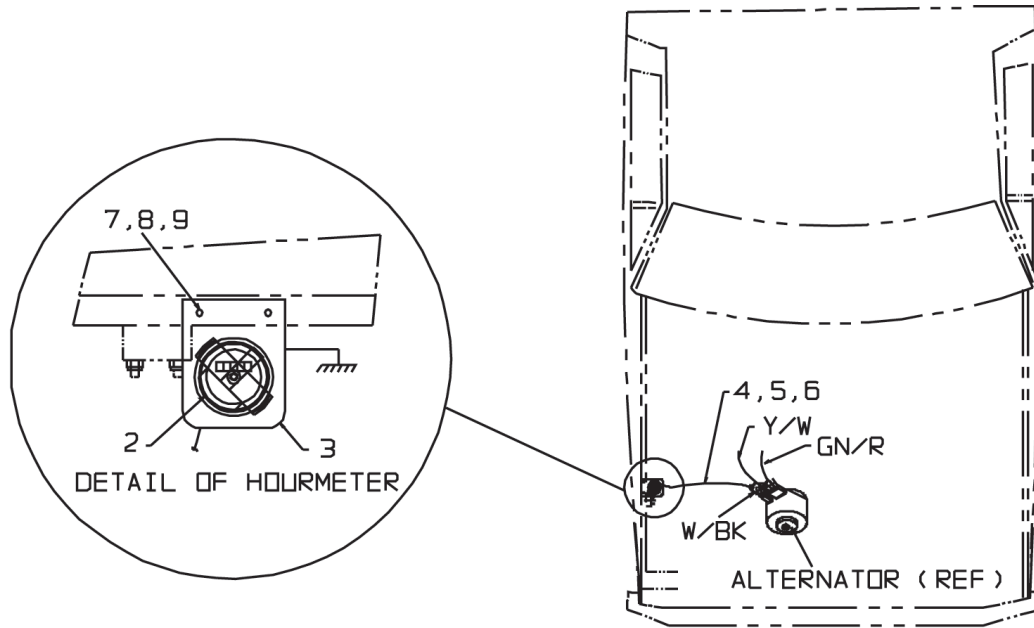
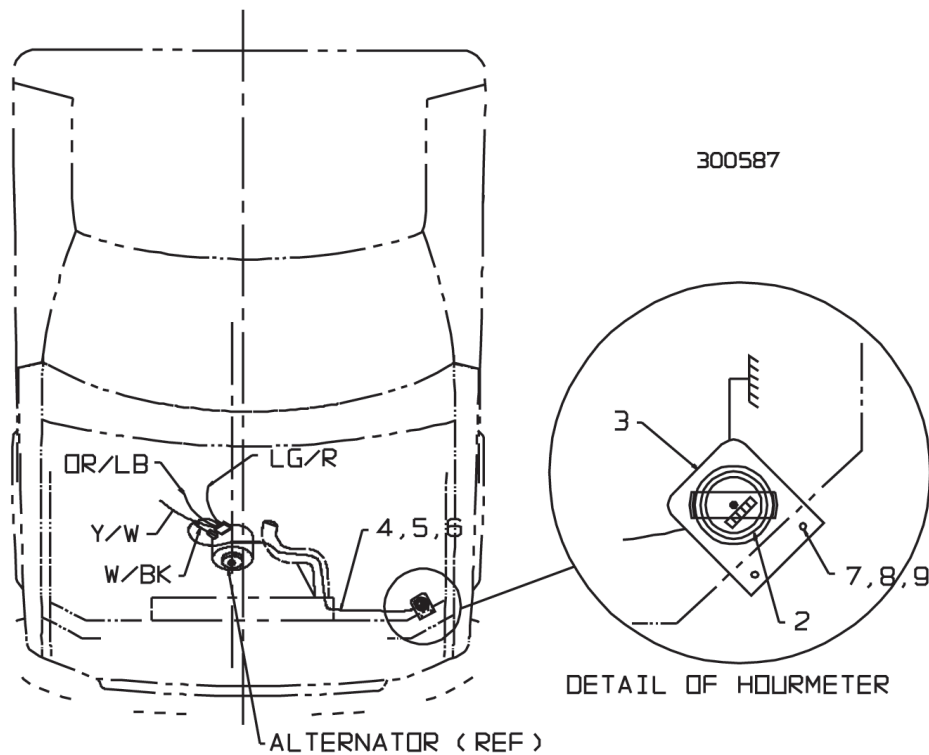


FIGURE 30.
HOUR METER OPTION, 95 & EARLIER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
30-	8925		Hour Meter Option, 95 & Earlier		Ref
3	3.2283	2081-4-2	Bushing		1
5	2.2613	Comm	Wire, #16 AWG, Blue, 70"		1
6	2.2568	Comm	Wire, #16 AWG, Red, 70"		1
7	1.5905	776-4/40	Hourmeter (16476)		1
8	3.2963	8925-08	Washer, Neobond 10		2
9	1.5196 or 12285		Bracket, Hour Meter		1
10	2.0800	Comm	Terminal, Ring, 16 Ga. x 1" Dia.		2
11	2.3506		Switch, Pressure, 15 psi		1
12	3.0802	Comm	Tee, 1/4 NPT, Galv.		1
13	3.1496	Comm	Nipple, 1/4 NPT x 2 1/2, Galv.		1
14	2.3478	Comm	Conduit, Flex Guard, 1/4" x 13'		1
15	2.1614	Comm	Wire, #16 Green, 6"		1
16	2.0801	Comm	Terminal, #8 Ring		6



HOUR METER OPTION GAS AND DIESEL 96/97



HOUR METER OPTION. GAS. 99+ LATER

FIGURE 31.
HOUR METER OPTION, GAS, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
31-	300857		Hour Meter Option, Gas, 96/97	A	Ref
			Hour Meter Option, Gas, 99 & Later	B	Ref
2	1.5905		Gauge, Hour Meter		1
3	18921		Bracket, Hour Meter		1
4	2.2612	Comm	Wire, 16 Ga. Black, 96/97		36"
	2.2613		Wire, 16 Ga. Blue, 99 & Later		36"
5	2.3478	Comm	Flexguard, 1/4"		36"
6	2.0801	Comm	Terminal, #8 Ring		2
7	Comm		HHCS, #8-32		2
8	Comm		Nut, #8-32		2
9	Comm		Washer, #8		8

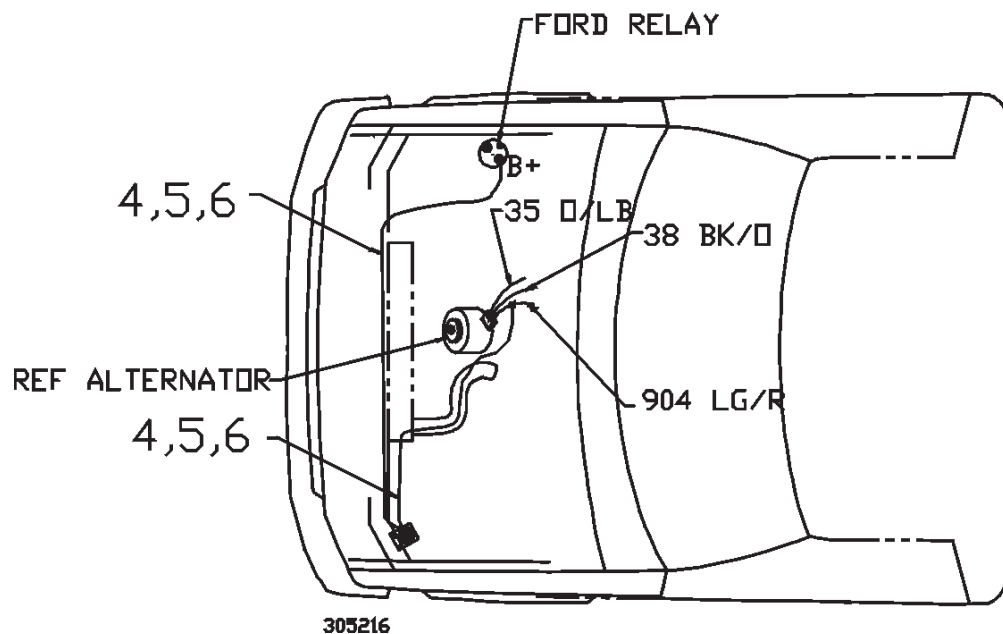
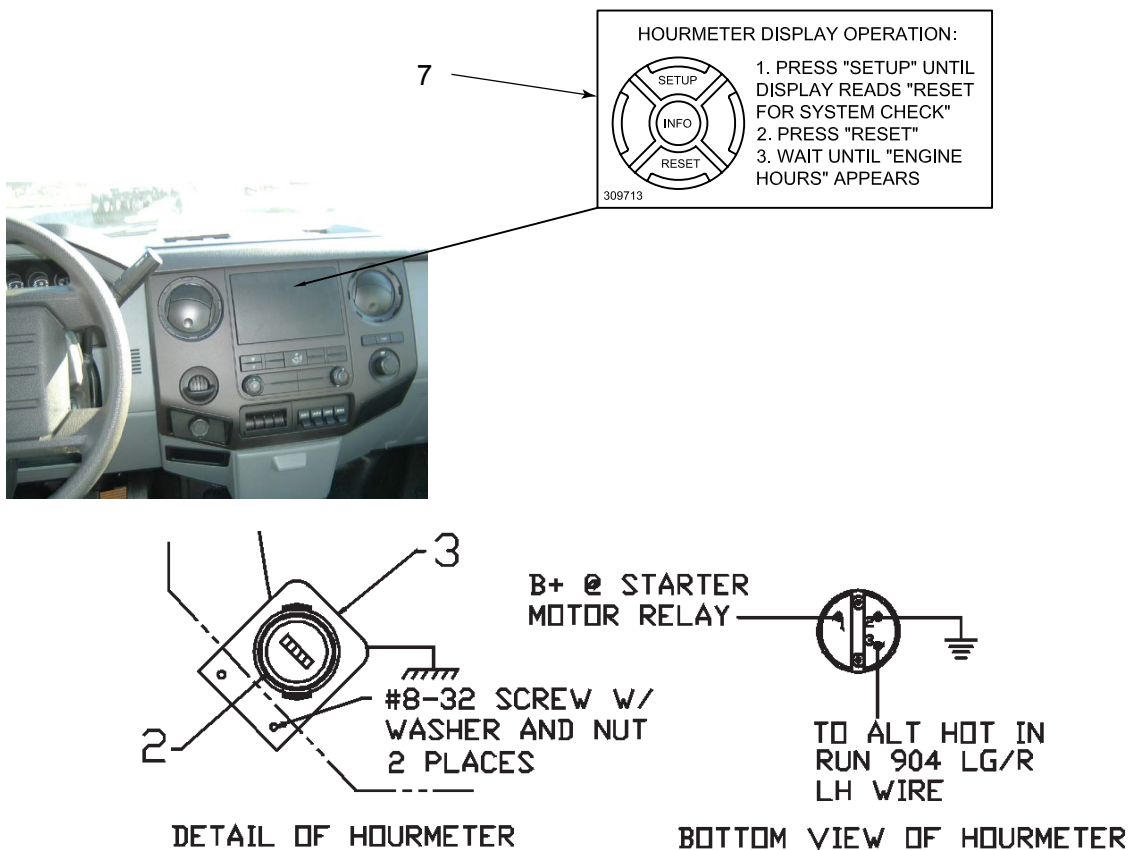


FIGURE 32.
HOURLMETER INSTALLATION OPTION, DIESEL, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
32-	305216		Hourmeter Installation Option, Diesel, 99 & Later		Ref
	309714		Option, Hourmeter Display F350	I	Ref
2	1.8317		Gauge, Hourmeter		1
3	18921		Bracket, Hourmeter		1
4	2.2613		Wire, 16 GA, Black		96'
5	2.3478		Flexgaurd, 1/4"		96"
6	F104276		Terminal, 3/16 Female Blade, Insul.		3
7	309713		Decal, Hourmeter Operation F350	I	1

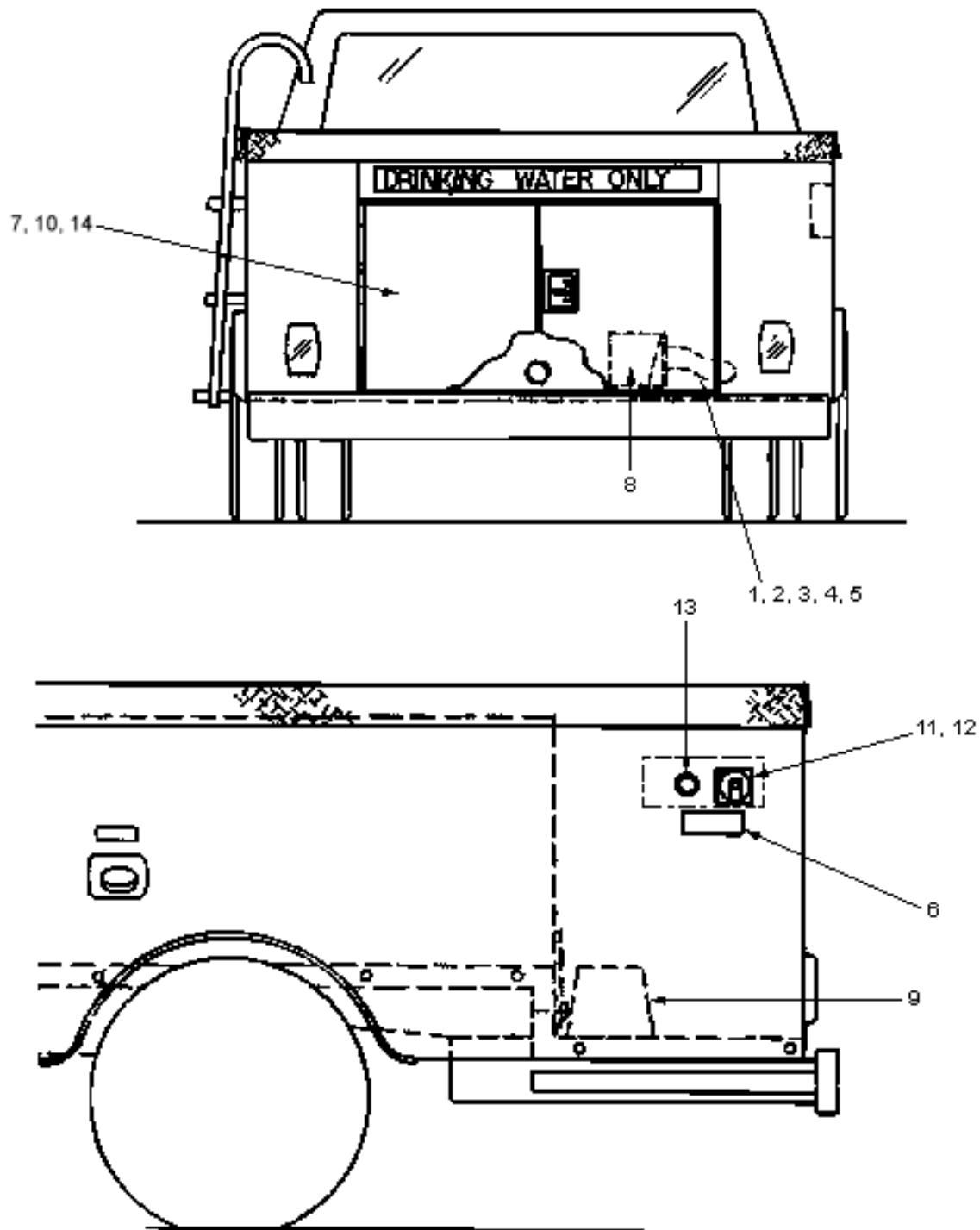


FIGURE 33.
HEAT OPTION, 120V/240 & 12V
1 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
33-	12207W		Heat Option, 120V & 12V, 1 of 2		Ref
1	Comm		Ty Wrap		A/R
2	1.0443		"Y" Connector		2
3	3.1085		Hose Clamp		8
4	9.0027		Hose Heater		50'
5	1.0519		Tube, Insulated		30'
6	562A54		Placard		1
7	9.0365		Styrofoam		48"
8	2.0348	356	Heater, Water (80883)		1
9	305375		Bracket, Heater		1
10	16021		Door Liner		2
11	2.2593		Receptacle		1
12	2.2931		Electrical Diagram		Ref
13	2.0450		Pilot Light		1
14	16021		Door Liner		2
NS	8517		Truck Preparation for Heat Option		1

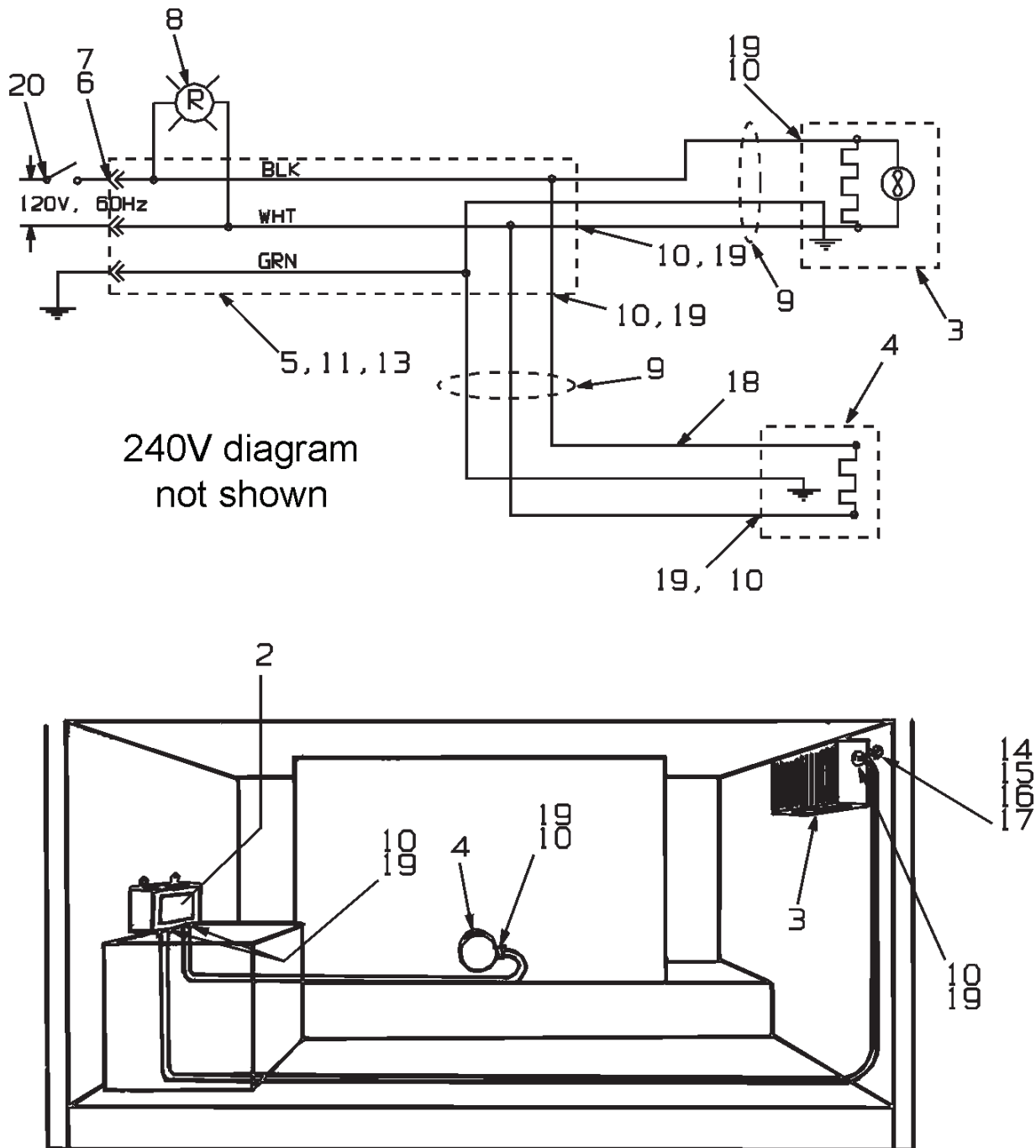


FIGURE 33.
HEAT OPTION, 120V/240 & 12V
2 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
33-	12209		Heat Option, 120V & 12V, 2 of 2		Ref
2	562A317		Placard		1
3	2.0358	9376N	Heater (94227)		1
4	2.0356	MT220	Heater, Immersion (07131)		1
5	9469		Junction Box		Ref
6	2.2593	Comm	Receptacle		Ref
7	2.2931	Comm	Plug		Ref
8	2.0450	Comm	Light, Pilot		Ref
9	2.0891	Comm	Cable, 12-3 SO		18'
10	2.0180	CG-5050	Connector (V07343)		4
11	1.1220		Plug		2
13	1.1877		Plug		7
14	Comm		RHMS, 1/4-20 x 1.00		2
15	Comm		Nut, Hex, 1/4-20		2
16	Comm		Washer, Flat, 1/4		2
17	Comm		Washer, Lock, 1/4		2
18	2.3478	Comm	Conduit, Flexguard		20'
19	2.3442	Comm	Nut, Sealing, 1/2"		4
20	2.3013	1TL1-2	Switch (V91929)		1

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
33-	303652		Heat Option, 240V & 12V,		Ref
2	562A317		Placard		1
3	304181		Heater		1
4	304178		Heater, Immersion		1
5	9469		Junction Box		Ref
6	2.3698	Comm	Receptacle		Ref
7	2.2931	Comm	Plug		Ref
8	2.3686	Comm	Light, Pilot		Ref
9	2.0891	Comm	Cable, 12-3 SO		18'
10	2.0180		Connector		4
11	1.1220		Plug		2
13	1.1877		Plug		7
14	Comm		RHMS, 1/4-20 x 1.00		2
15	Comm		Nut, Hex, 1/4-20		2
16	Comm		Washer, Flat, 1/4		2
17	Comm		Washer, Lock, 1/4		2
18	2.3478	Comm	Conduit, Flexguard		20'
19	2.3442	Comm	Nut, Sealing, 1/2"		4
20	2.3013	1TL1-2	Switch (V91929)		1

Illustration Not Available at Time of Publication

FIGURE 34.
HEAT, 402, 120V & 12V OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
34-	305371		Heat, 402, 120V & 12V Option		Ref
	8517		Heater Hose Installation		1
	562A54		Placard, 110V, AC-Only		1
	2.0348		Heater, Cab, 5000-12VDC		1
	12209		Electrical Assembly, Heater Kit		1

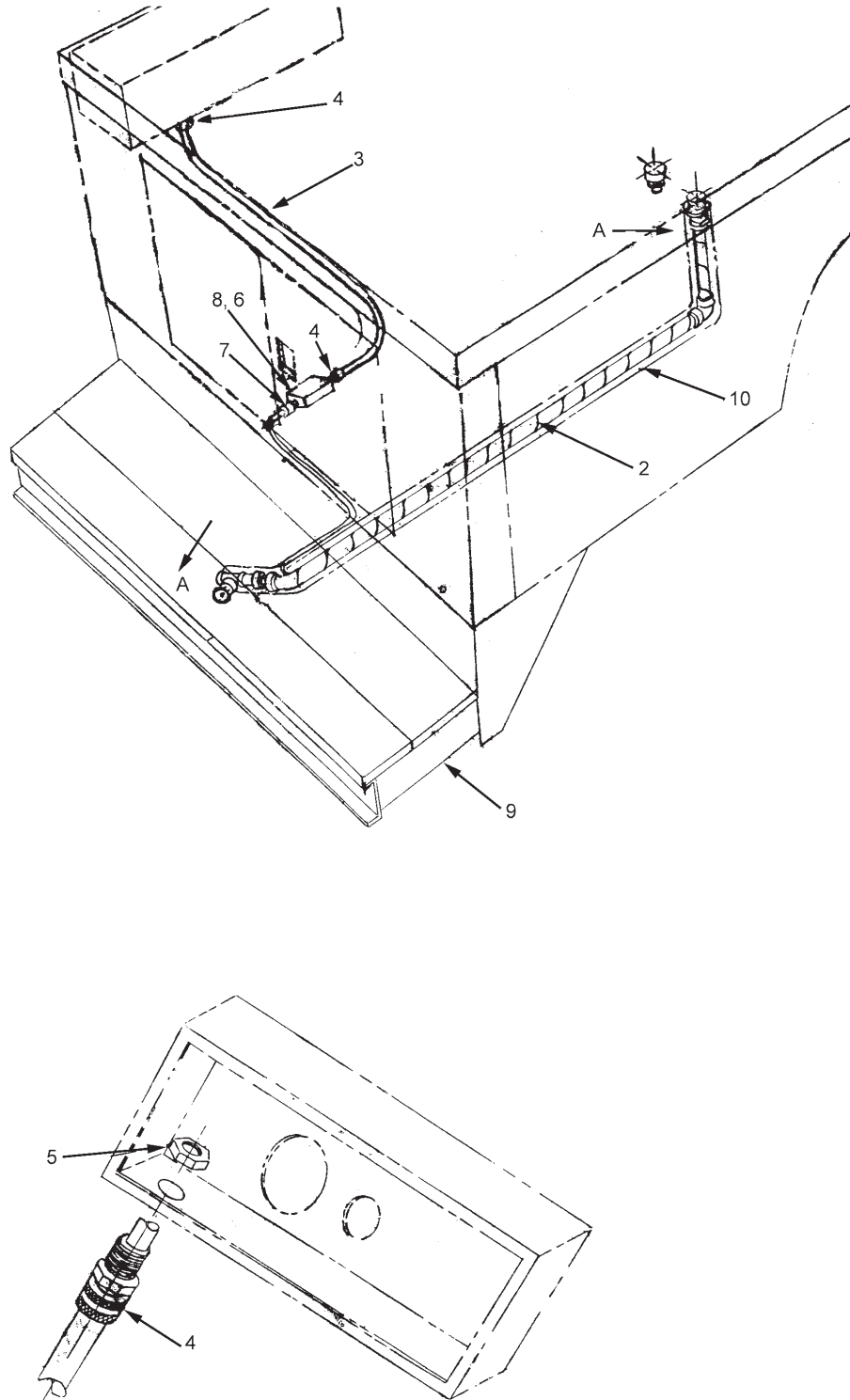


FIGURE 35.
HEAT TRACE, DRAIN OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
35-	17697		Heat Trace, Drain Option		Ref
2	2.3622		Cable, #SR15-120V		1
3	2.0906		Wire 14/3 SO		96"
4	2.0178		Connector, Cable		2
5	2.3442		Nut, 1/2 Elec Seal		1
6	2.3431		Box, Junction, 4 x 2.5 x 2		1
7	2.0176		Connector, 1/2" Hub		1
8	2.0192		Nut, Wire, 12 GA, Type Y		2
9	13657		Rear Plat. w/ Access Door Option		Ref
10	17698		Tank Drain Option		Ref

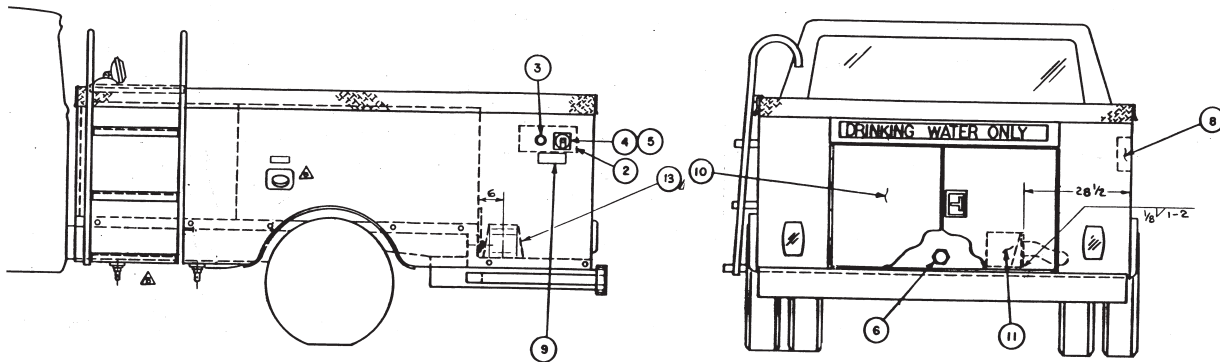


FIGURE 36.
HEAT WIRING AND HOSES ONLY OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
36-	304676		Heat Wiring & Hoses Only Option		Ref
2	6867.06		Junction Box		Ref
3	2.0450		Pilot Light		Ref
4	2.2593		Receptacle		Ref
5	2.2931		Plug		Ref
6	8547.04		Heater, Immersion		Ref
7	8517		Heater Hose Inst'l		1
8	8547.03		Heater		Ref
9	M562-A54		Placard		Ref
10	9.0365		Styrofoam		2
11	2.0348		Hot Water Heater		Ref
13	6853.27		Heater Bkt		Ref
14	16021		Door Liner		2

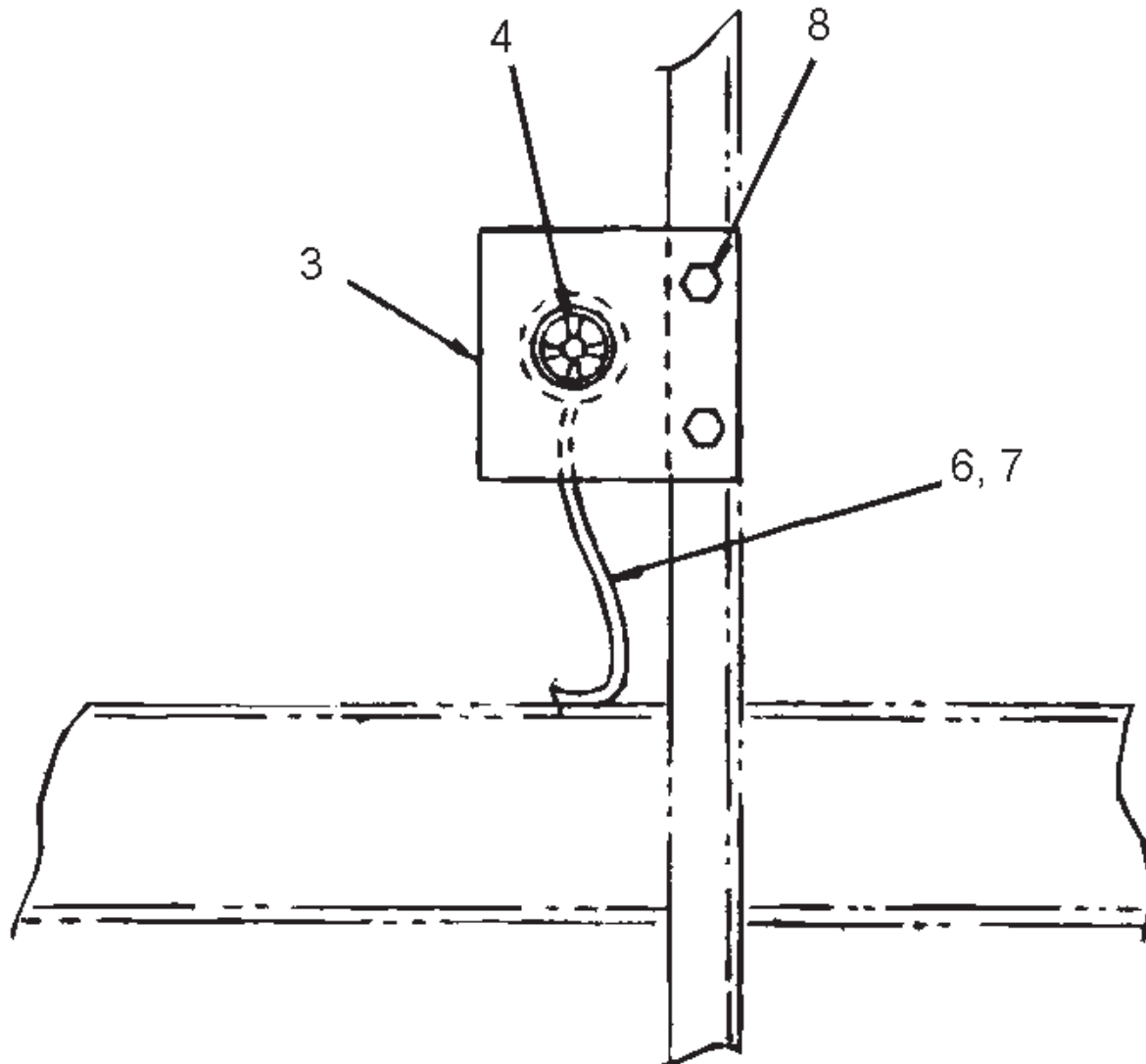
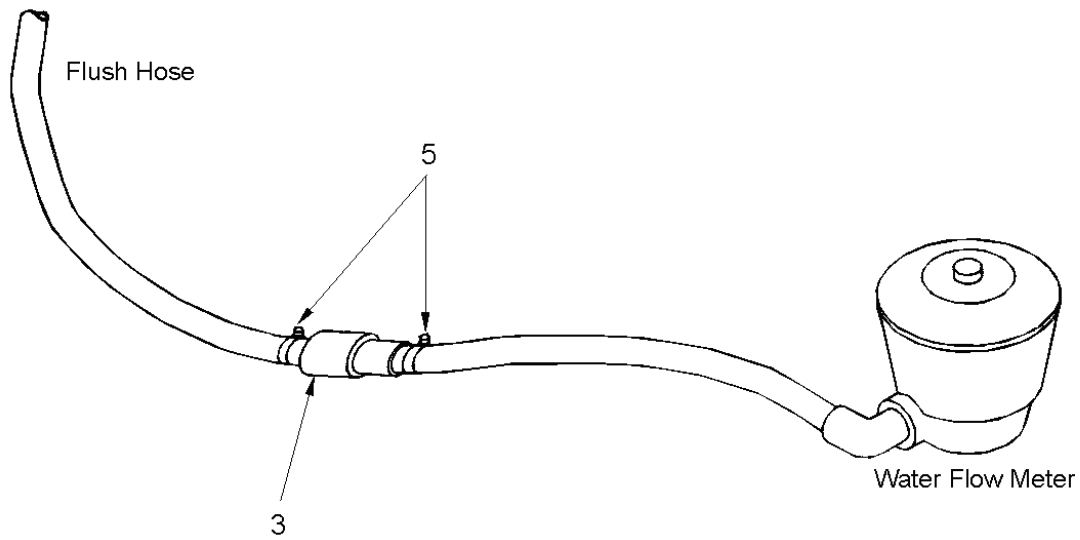
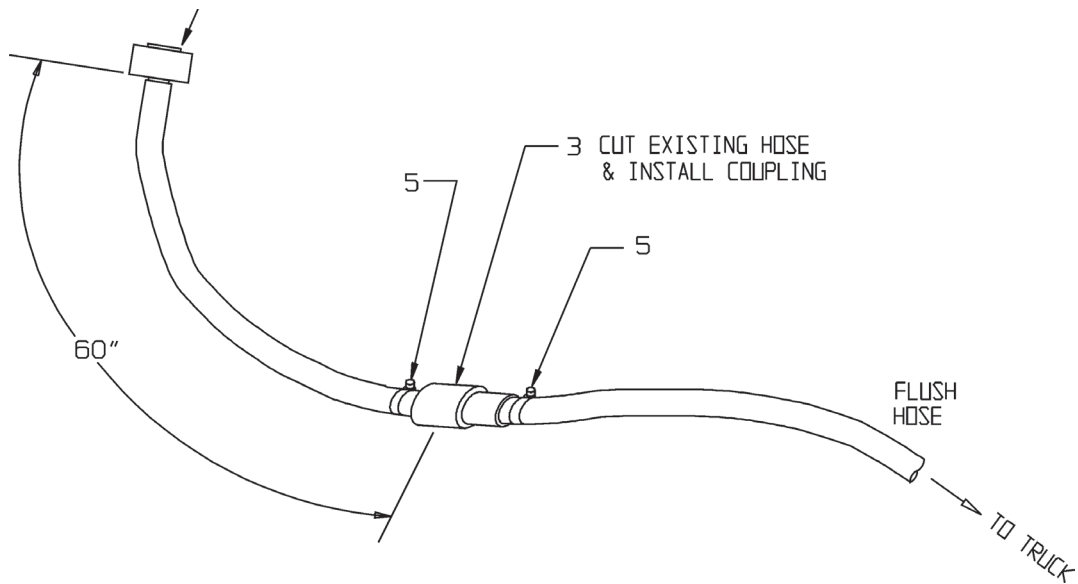


FIGURE 37.
ALARM, BACKUP OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
37-	16499		Alarm, Backup, Option		Ref
3	14733		Bracket, Alarm Mounting		1
4	2.3665		Alarm		1
6	2.2612		Wire		60
7	2.3478		Flex Guard, 1/4"		24
8	Comm		Screw, self-drill, 1/4-20 x 0.50		2



**FIGURE 38.
BREAKAWAY KAISER COUPLING OPTION**



**FIGURE 39.
COUPLING, BREAKAWAY, A/C END, OPTION**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
38-	17576		Breakaway Kaiser Coupling Option		Ref
1	1.8552	0030-0087	Coupling, Breakaway, 1" Hose (86831)		1
2	3.1086	QS200-M12S	Hose Clamp, SS, 13/16 - 1-1/2		2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
39-	307295		Breakaway A/C, Option		Ref
3	1.8552	0030-0087	Coupling, Breakaway, 1" Hose (86831)		1
5	309988		Instln, Clamp, Shrink		2

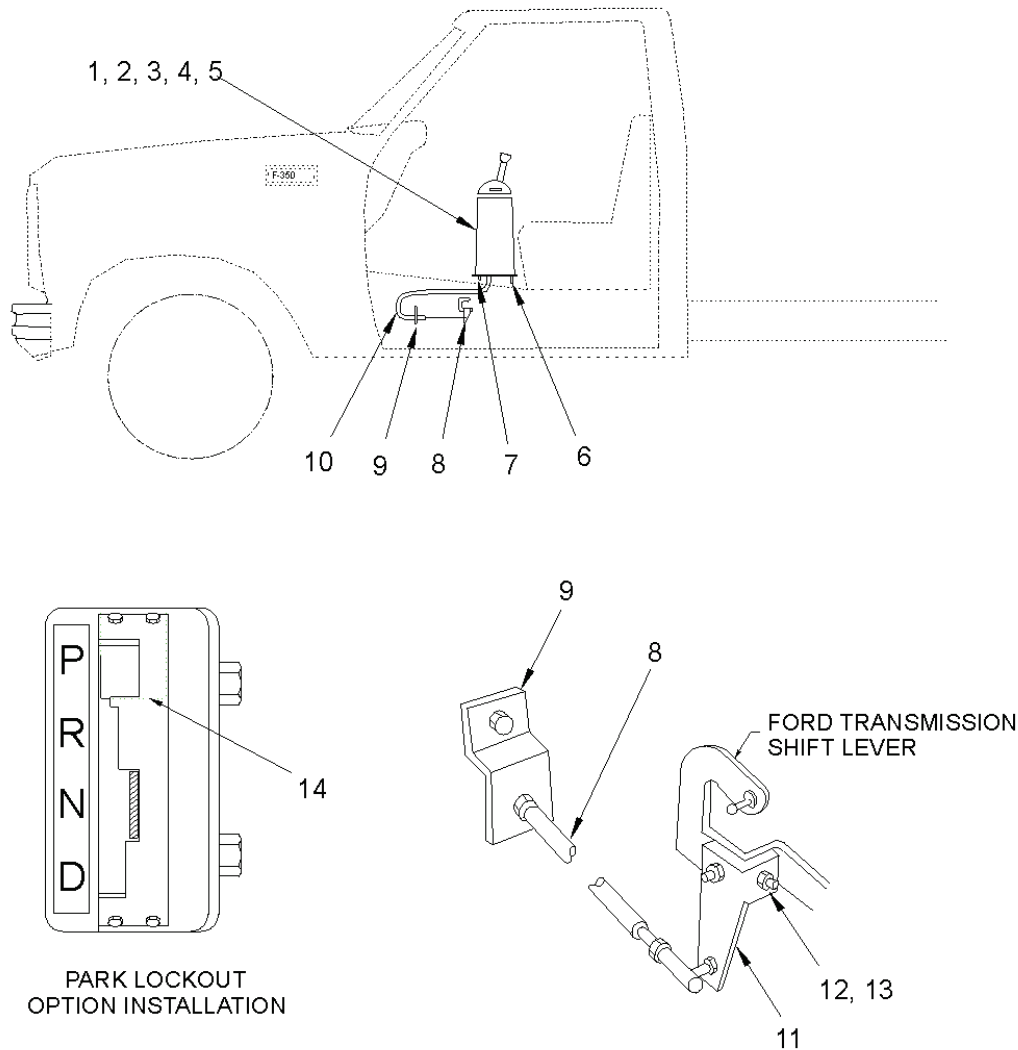


FIGURE 40.
MORSE CONTROL OPTION, THROUGH 1997 CHASSIS
1 OF 3

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
40-	19741		Morse Control Option, through 1996 Chassis, 1 of 3	A	Ref
	302257		Morse Control Option, DNRP 1997+ Chassis, 1 of 3	B	Ref
1	1.5956	D044585	Floor Stand (41625)		1
2	Comm		HHCS, 1/4-20 x 1.50		4
3	Comm		Nut, Lock, 1/4-20		4
4	Comm		Washer, Flat, 1/4		16
5	1.5943	E063665	Morse Transmission Control Assembly (41625)		1
6	8926.9		Spacer, Control Stand, LH Rear, 3/4" Lg		1
7	8926.8		Spacer, Control Stand, LH Front 1" Lg		1
8	1.5955	A038491	Ball Joint (V41625)		1
9	20747		Bracket, Cable		1
	302214		Bracket, Cable	B	1
10	1.6015	D037911-003-0072	Cable, Control (V41625)		1
11	19430		Bracket, Morse Control		1
12	Comm		RHMS, #10-32 x 0.75		2
13	Comm		Nut, Lock, #10-32		2
14	9589		Lockout, Park (by customer request only)		2
NS	302215		Brkt, Shifter Extension	B	1

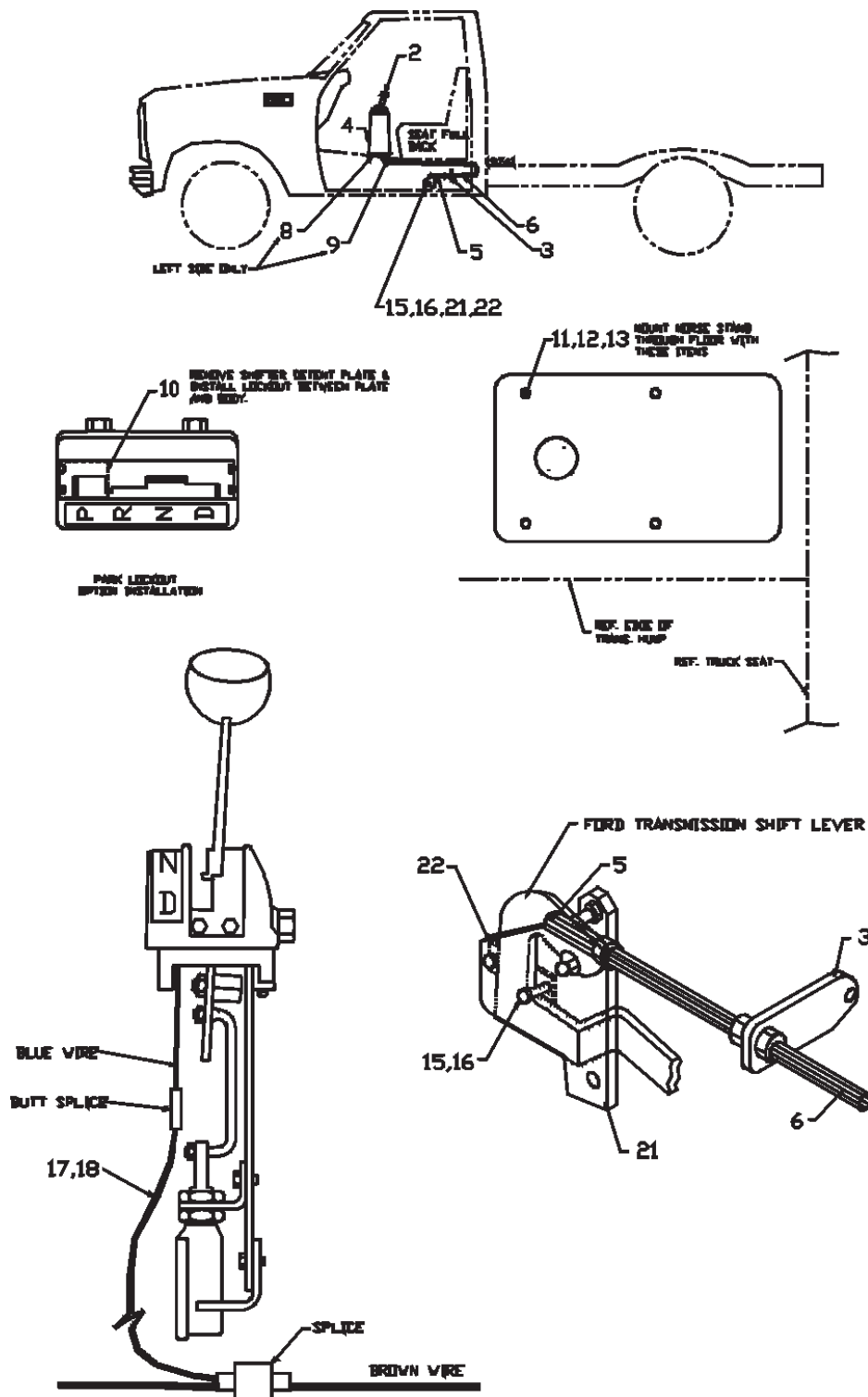


FIGURE 40.
MORSE CONTROL OPTION, 1997 CHASSIS AND LATER
2 OF 3

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
40-	19741		Morse Control Option, 1997 Chassis and Later, 2 of 3	B	Ref
	302257		Morse Control Option, DNRP 1997+ Chassis, 1 of 3	B	Ref
2	1.5943	E063665	Morse Transmission Control Assembly (41625)		1
3	20747		Bracket, Cable		1
4	1.5956	D044585	Floor Stand (41625)		1
5	1.5955	A038491	Ball Joint (41625)		1
6	1.6015	D037911-003-0072	Cable, Control (41625)		1
8	8926.8		Spacer, Control Stand, LH Front 1" Lg		1
9	8926.9		Spacer, Control Stand, LH Rear, 3/4" Lg		1
10	9589		Lockout, Park (by customer request only)		2
11	Comm		HHCS, 1/4-20 x 1.50		4
12	Comm		Nut, Lock, 1/4-20		4
13	Comm		Washer, Flat, 1/4		16
15	Comm		HHCS, 1/4-20 x 0.75		2
16	Comm		Nut, Lock, 1/4-20		2
17	2.3437	Comm	Wire, Black, 14AWG 600V THHN		6'
18	2.3478	64496-R	Conduit, 1/4 Flexguard (77060)		6'
21	20746		Adapter, C-6 Shift		1
22	10198		Plate, Clamp, Trans. Shifter		1

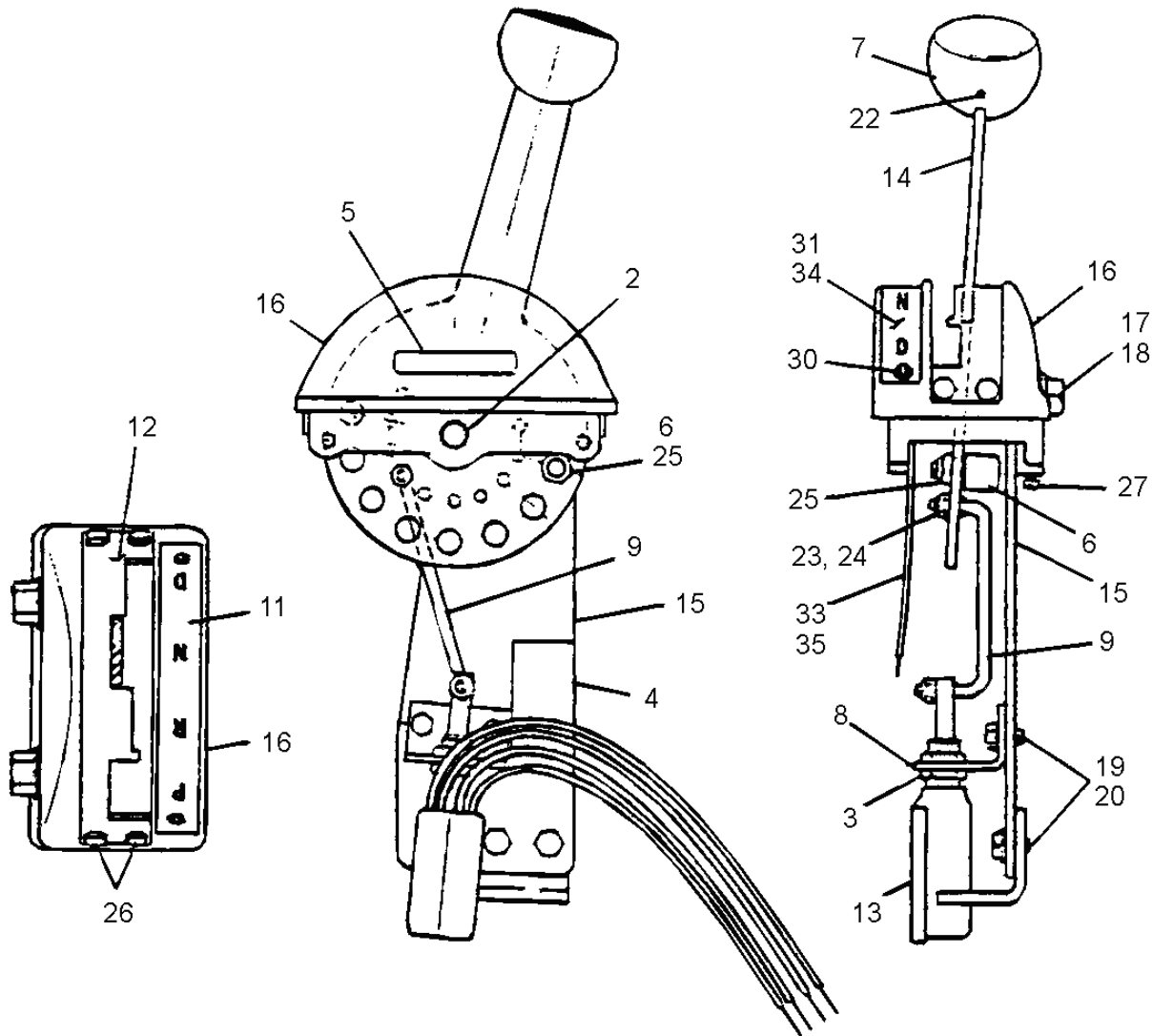
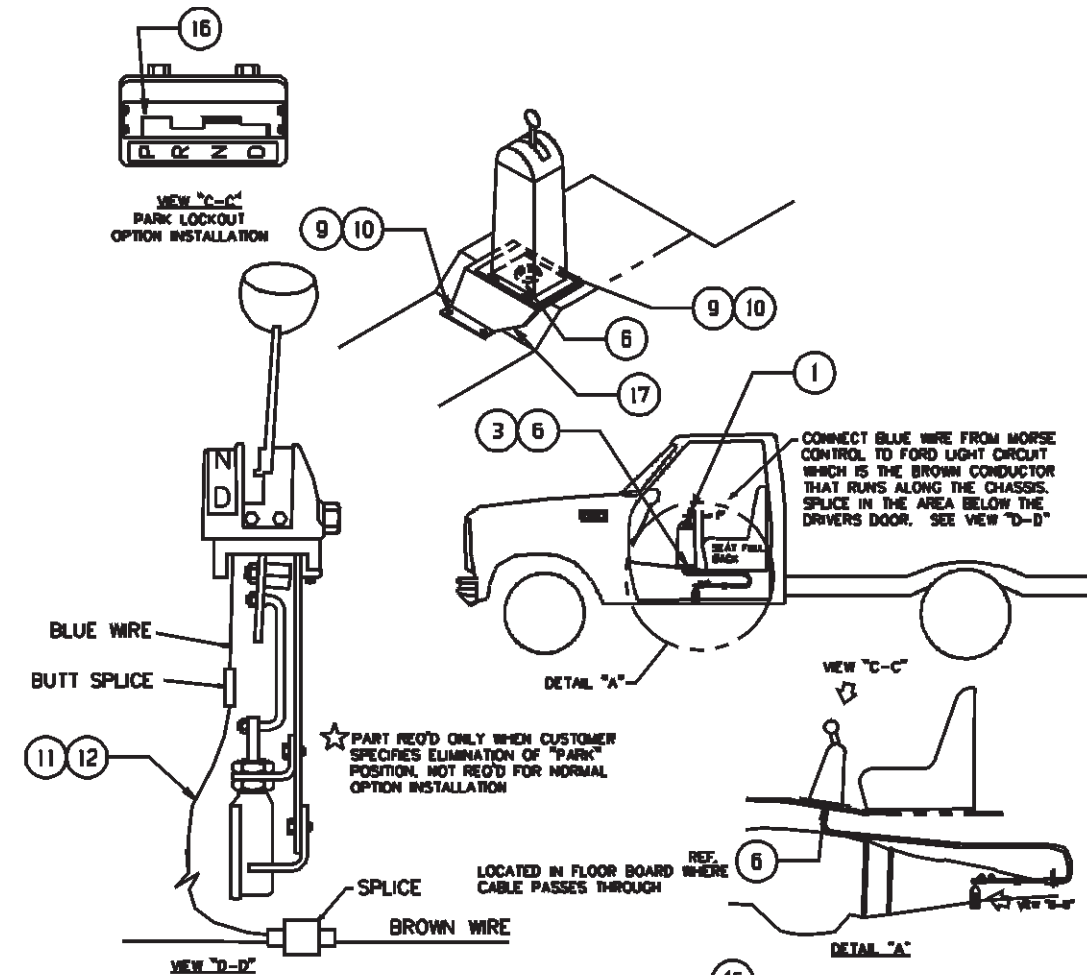


FIGURE 40.
MORSE CONTROL OPTION, 1997 CHASSIS AND LATER
3 OF 3

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
40-	19741		Morse Control Option, Morse Control Assembly, 3 of 3		1
	302257		Morse Control Option, DNRP 1997+ Chassis, 1 of 3	B	Ref
2		A43698	Shaft		1
3		A43716	Nut		2
4		A48449	Decal, Patent		1
5		A60058	Decal, Morse		1
6		843197	Trunnion		1
7		A68444	Knob		1
8		843684	Bracket, Switch		1
9		848353	Arm, Switch Actuator		1
10		843685	Support, Cable		1
11		8300207-1	Strip, Position		1
12		863657	Gate Plate, P-R-N-D		1
	303044		Plate, Shift Gate, Morse, F-N-R, Option		Ref
13	2.1898	845184	Switch		1
14		D68703-1	Lever, Shift		1
15		D43683-1	Adapter Plate		1
16		E44405-1	Housing		1
17		A50407-842	HHCS, 3/8-24 x 0.75"		2
18		A50803-099	Washer, Internal Tooth Lock, 3/8"		2
19		A50407-033	HHCS, 1/4-28 x 0.50"		4
20		A50801-327	Lockwasher, Split, 1/4"		4
22		A50602-508	Setscrew, 14-20 X 3/8"		2
23		A50908-296	Nut, ESNA, #10-32		2
24		A51200-024	O-Ring, 3/16" I.D. X 5/16" O.D. X 1/16" W		2
25		A50908-336	Nut, ESNA, 5/16-24		1
26		A05406-427	HHCS, #10-24 x 3/8"		4
27		A50112-045	Screw, FIL HD, #10-24 X 0.50"		1
28		A51700-008	Lubricant		A/R
29		A51701-006	Loctite, Grade AA, Green, Low Viscosity		A/R
30		A50151-289	Screw, Phillips HD Truss, #6-32 X 7/16"		2
31		A44654	Reflector Strip		2
33		A45063-1	Pigtail Assembly		1
34		844406	Light Pipe		1
35		A51800-001	Bulb, G.E. #53 or Equivalent		1



NOTE: NO DELETIONS REQUIRED FOR THIS OPTION

INSTALLATION INSTRUCTIONS FOR MORSE CONTROL

- 1) LOCATE POSITION OF HOLE PATTERN ON TRANSMISSION HUMP
A) ALLOW MIN. 1" CLEARANCE FOR SEAT FORWARD ADJUSTMENT
B) LOCATE BRACKET, ITEM 17, ON FLOOR AND TRANSMISSION TUNNEL WITH BRACKET AGAINST TUNNEL.
2) 1-1/2" Ø HOLE SAW FOR CABLE AND ELEC.
3) MOUNT PEDESTAL WITH 1/4" x 1" HHCS.
4) TO REMOVE FORD TRANSMISSION SHIFTER & STEERING COLUMN, CUT BOOT BETWEEN LEVER AND STEERING COLUMN AND REMOVE PIN CONNECTING LEVER TO STEERING COLUMN, CUT WIRE AND TAPE END, DISCARD LEVER.
5) INSTALL THE NEW CABLE AND ADJUST AS FOLLOWS
A) PLACE BOTH THE MORSE CONTROL AND THE TRANSMISSION SHIFTER LEVER IN NEUTRAL
B) LOOSEN THE ADJUSTMENT NUTS ON THE CABLE AND TURN UNTILL THE BALL JOINT SLIDES FREELY AND SQUARELY INTO THE 1/4" HOLE (IN 303711) WITHOUT MOVING THE LEVER FROM THE DETENT POSITION
C) TIGHTEN THE ADJUSTMENT NUTS AND BALL JOINT

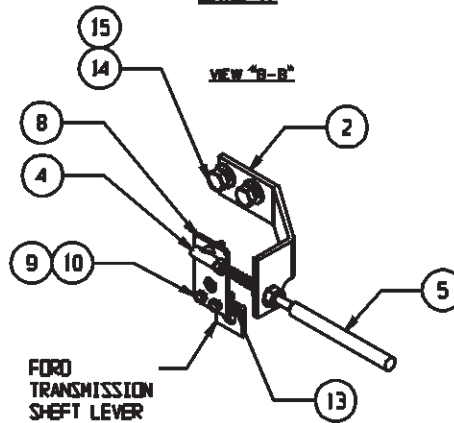


FIGURE 41.
MORSE CONTROL, OPTION, DNRP, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
41-	303810		Morse Control Option, DNRP, 99 & Later	B	Ref
1	306294		Morse Control Assy		1
2	306292		Bracket, Morse Control Cable Mtg		1
3	1.5956		Floor Stand		1
4	1.5955		Ball Joint		1
5	1.6015		Cable		1
6	302754		Grommet		1
8	306293		Shifter Extension Bracket		1
9	Comm		HHCS, 1/4-20 x 1.0 Lg.		6
10	Comm		ESNA Nut, 1/4-20		8
11	2.3437		Wire, Black, 14AWG 600V THHN, 6'		1
12	2.3478		Conduit, 1/4 Flexguard, 6'		1
13	303734		Clamp Plate, Transmission Shifter		1
14	302258		Bolt, Hex Head, M14 x 2 x 20mm Lg.		2
15	Comm		Washer, Locking		2
16	306286		Plate, Gate, DNRP		Ref
17	304047		Bracket, Morse Control Mounting		1

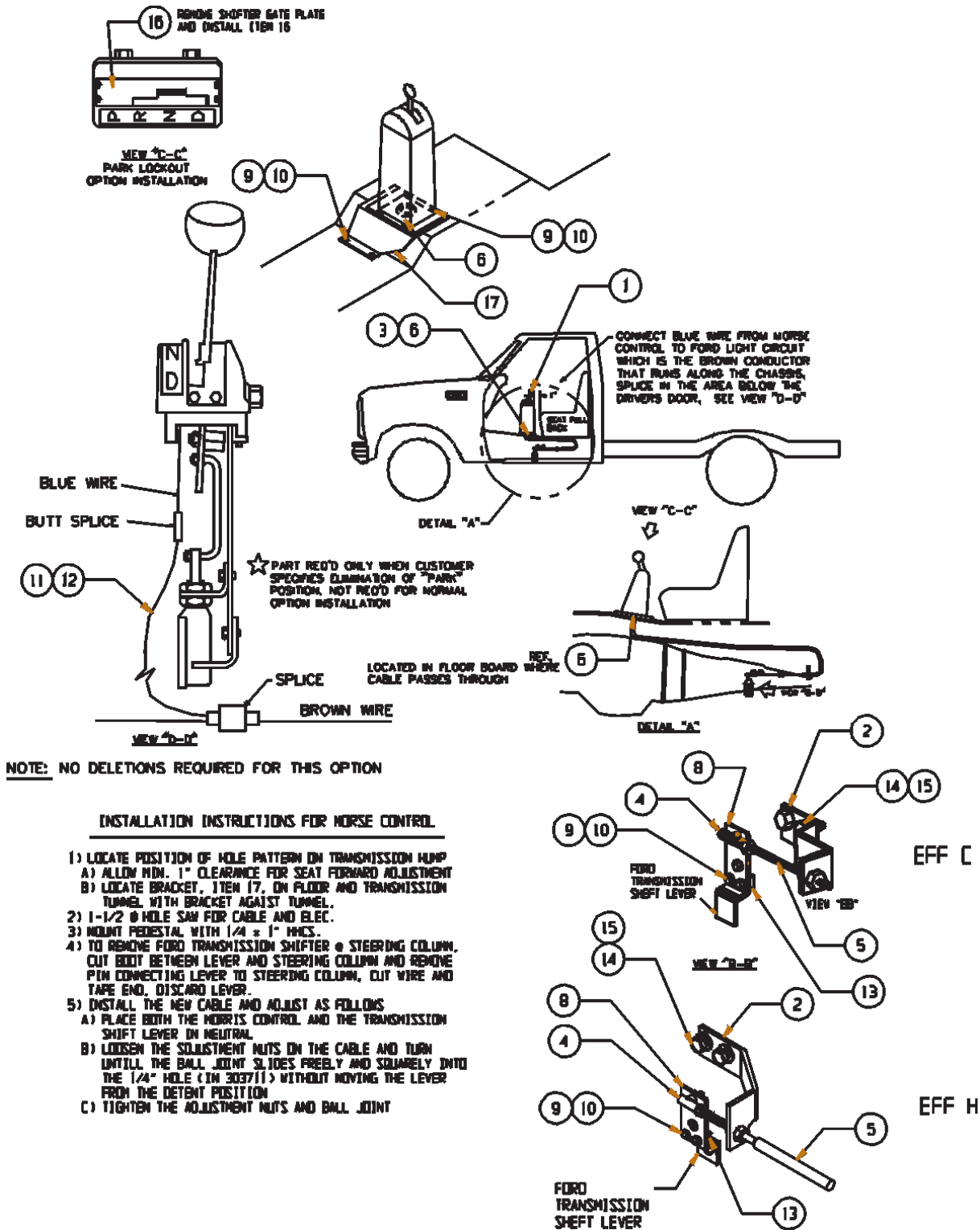


FIGURE 42.
MORSE CONTROL OPTION, DNR, 99-2000

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
42-	306325		Morse Control Option, DNR, 99-2000	B	Ref
	303810		Morse Control Option, DNR, 99 & Later	C	Ref
1	1.5943		Morse Control Assy	B	1
	306294		Morse Control Assy	C	1
2	303710		Bracket, Morse Control Cable Mtg	B	1
	306292		Bracket, Morse Control Cable Mtg	C	1
3	1.5956		Floor Stand		1
4	1.5955		Ball Joint		1
5	1.6015		Cable		1
6	302754		Grommet		1
8	303711		Shifter Extension Bracket	B	1
	306293		Shifter Extension Bracket	C	1
9	Comm		HHCS, 1/4-20 x 1.0 Lg.		6
10	Comm		ESNA Nut, 1/4-20		8
11	2.3437		Wire, Black, 14AWG 600V THHN, 6'		1
12	2.3478		Conduit, 1/4 Flexguard, 6'		1
13	303734		Clamp Plate, Transmission Shifter		1
14	302258		Bolt, Hex Head, M14 x 2 x 20mm Lg.		2
15	Comm		Washer, Locking		2
16	303044		Plate, Gate, DNR	B	1
	306287		Plate, Gate, DNR	C	1
17	304047		Bracket, Morse Control Mounting		1

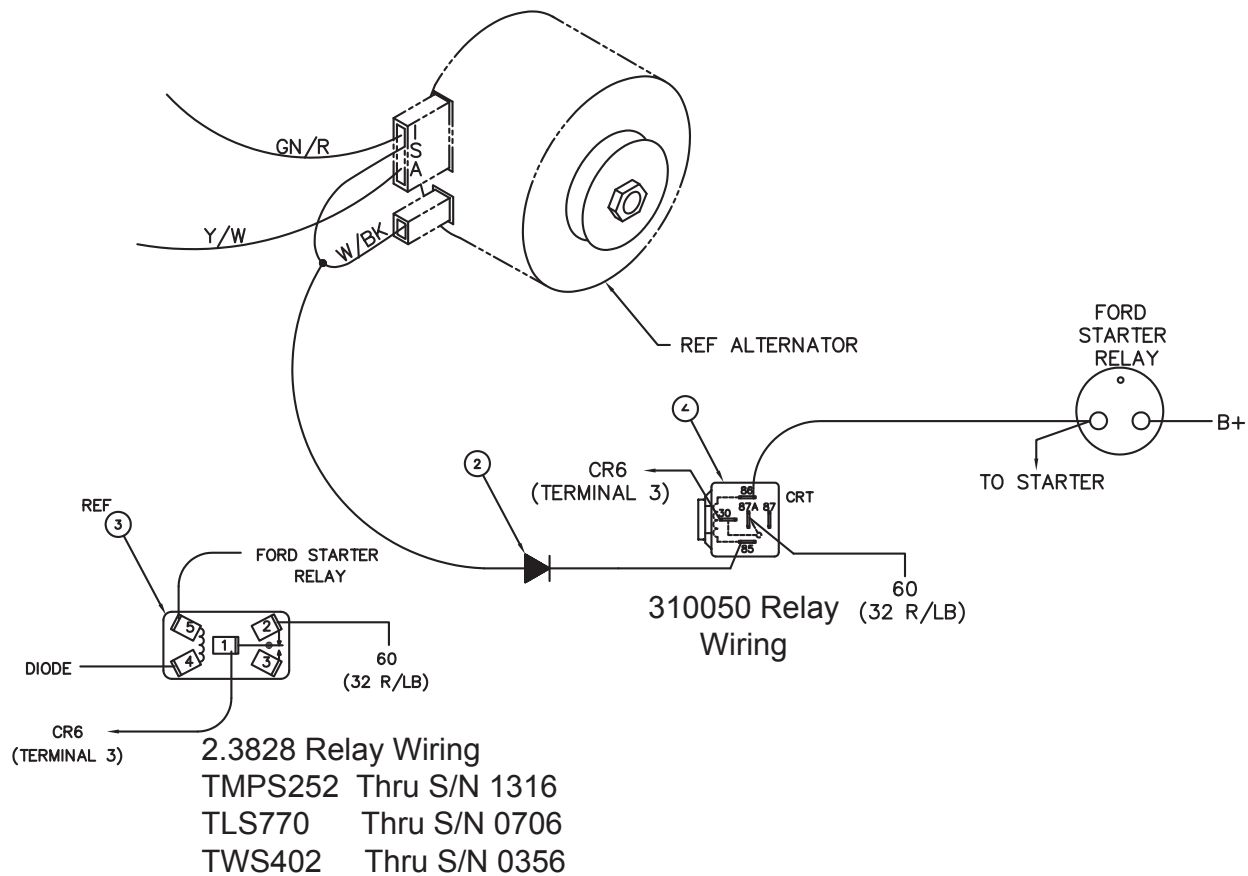


FIGURE 43.
STARTER PROTECTION OPTION, GAS & DIESEL, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
43-	300858		Starter Protection Option, Gas & Diesel, 96/97	A	Ref
2	2.3093		Diode		1
3	2.3828		Relay (Use SB505 for repairs)	D	1
4	310050		Relay, 6VDC, 40 A, Sealed	E	1

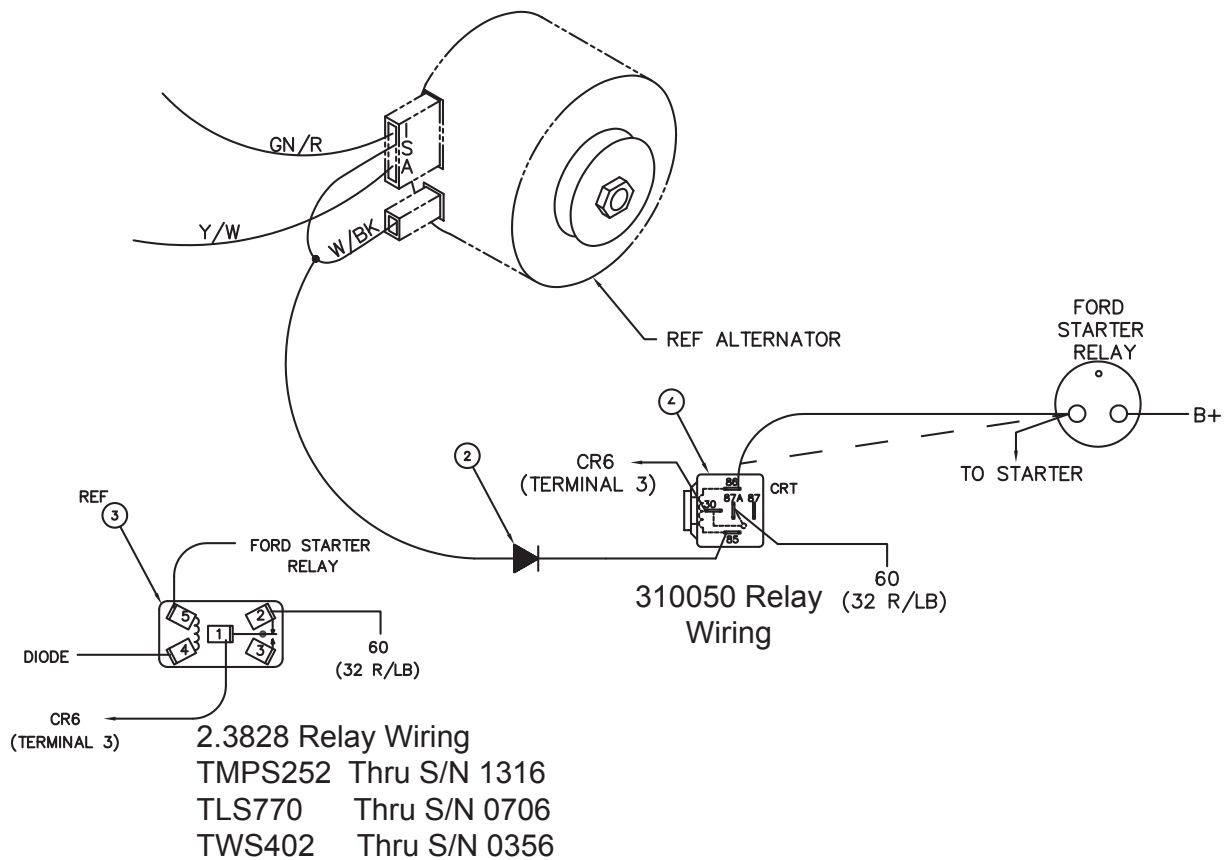


FIGURE 44.
STARTER PROTECTION, OPTION GAS 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
44-	300858		Starter Protection Option, Gas, 99 & Later	B	Ref
2	2.3093		Diode		1
3	2.3828		Relay (Use SB505 For Repairs)	D	1
4	310050		Relay, 6VDC, 40 A, Sealed	E	1

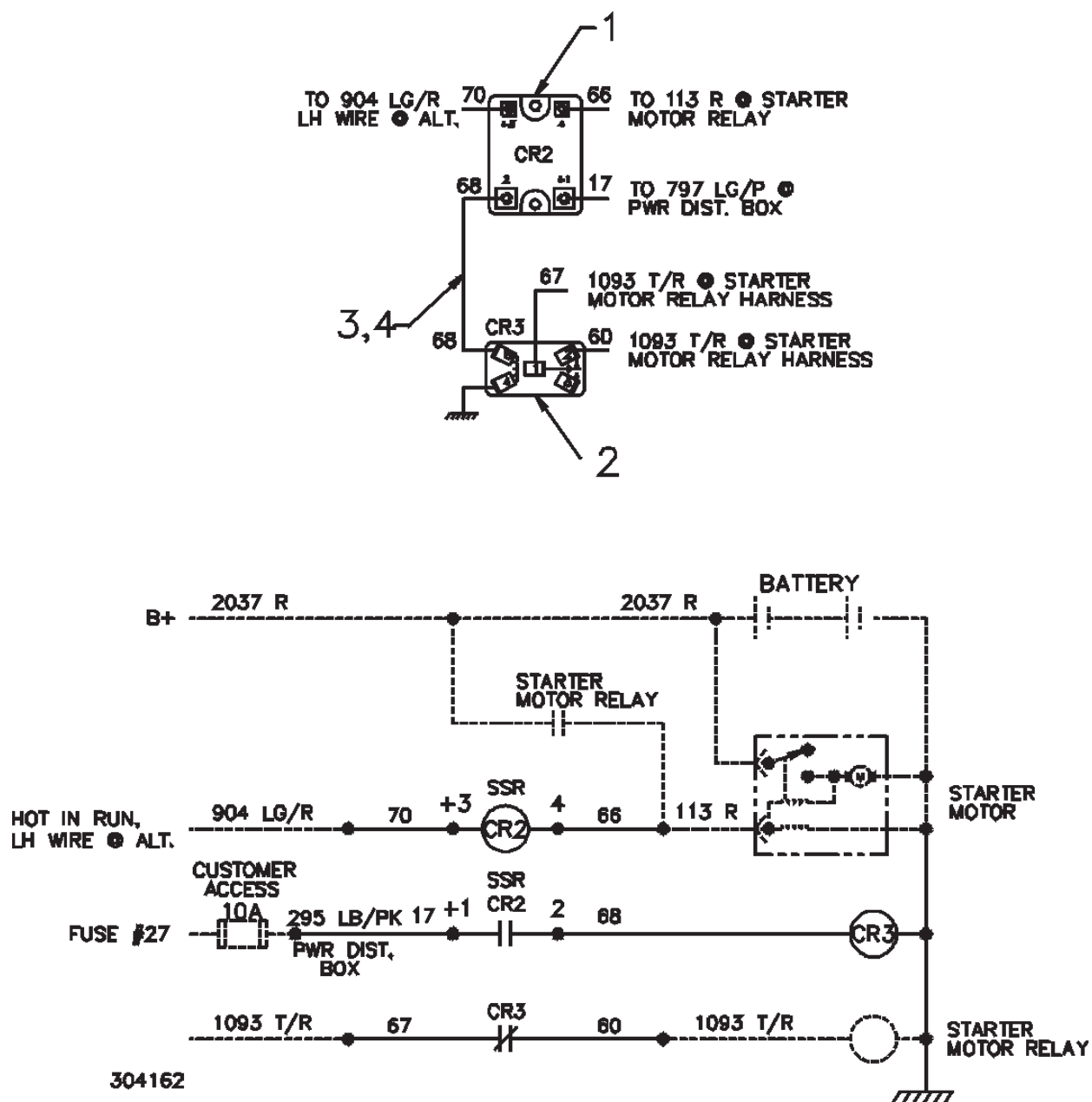
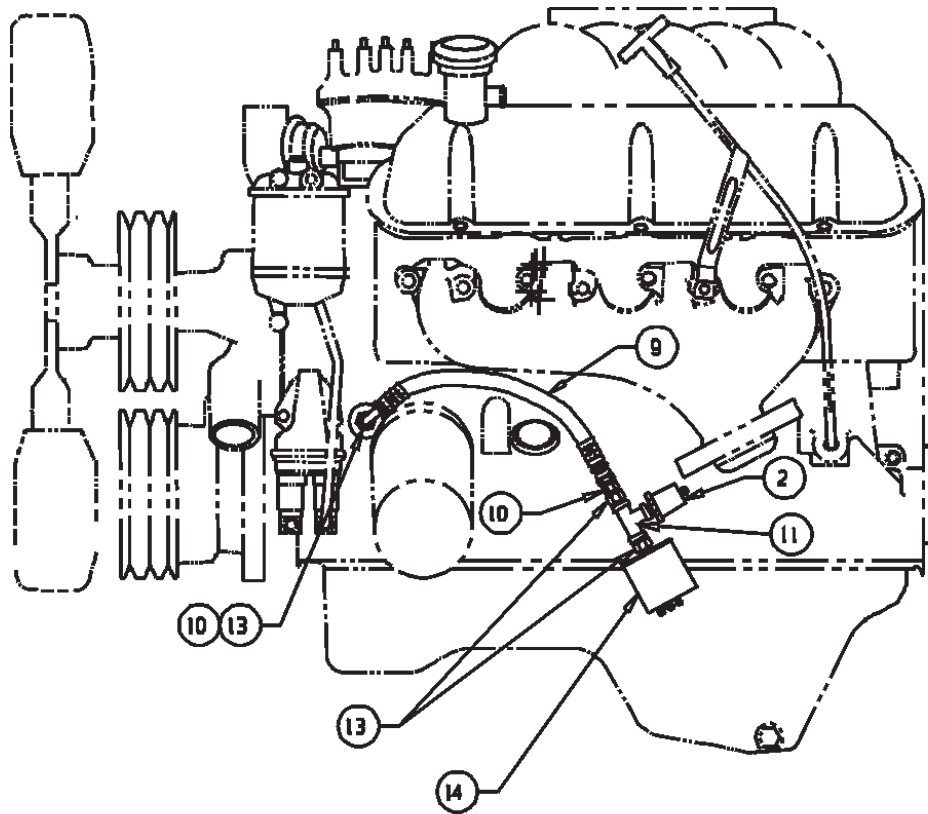


FIGURE 45.
STARTER PROTECTION, F350/F450, DIESEL, 1999 & LATER, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
45-	304162		Starter Protection, F350/F450, Diesel, 1999 & Later Option	B	Ref
1	2.3972		Relay, Solid State		1
2	2.3648		Relay, Coil Type (Use SB502 for repairs)		1
3	2.2612		Wire (Bk) 16 Ga, SAE J1128 GPT		240"
4	2.3478		Conduit, Flex		120"



**1996 THRU 1997
FORD ENGINE**

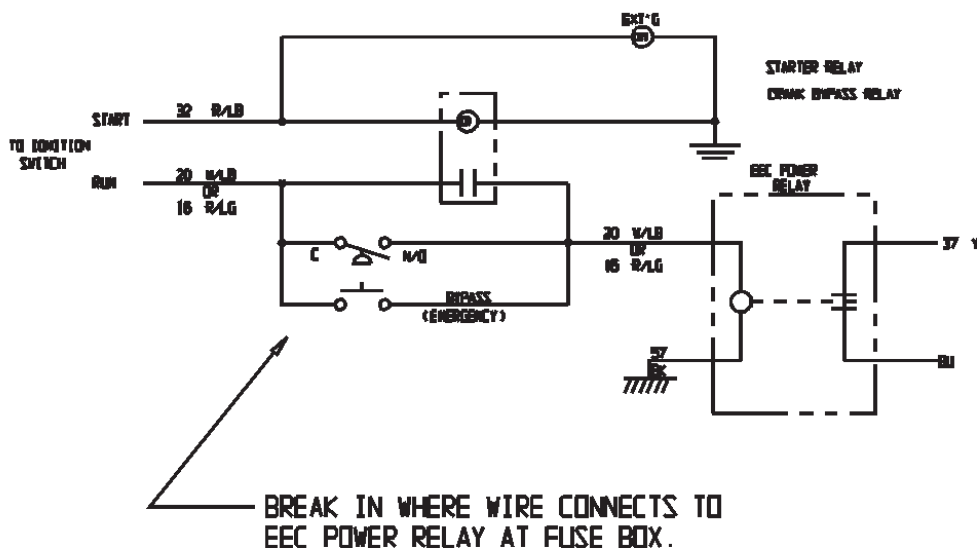
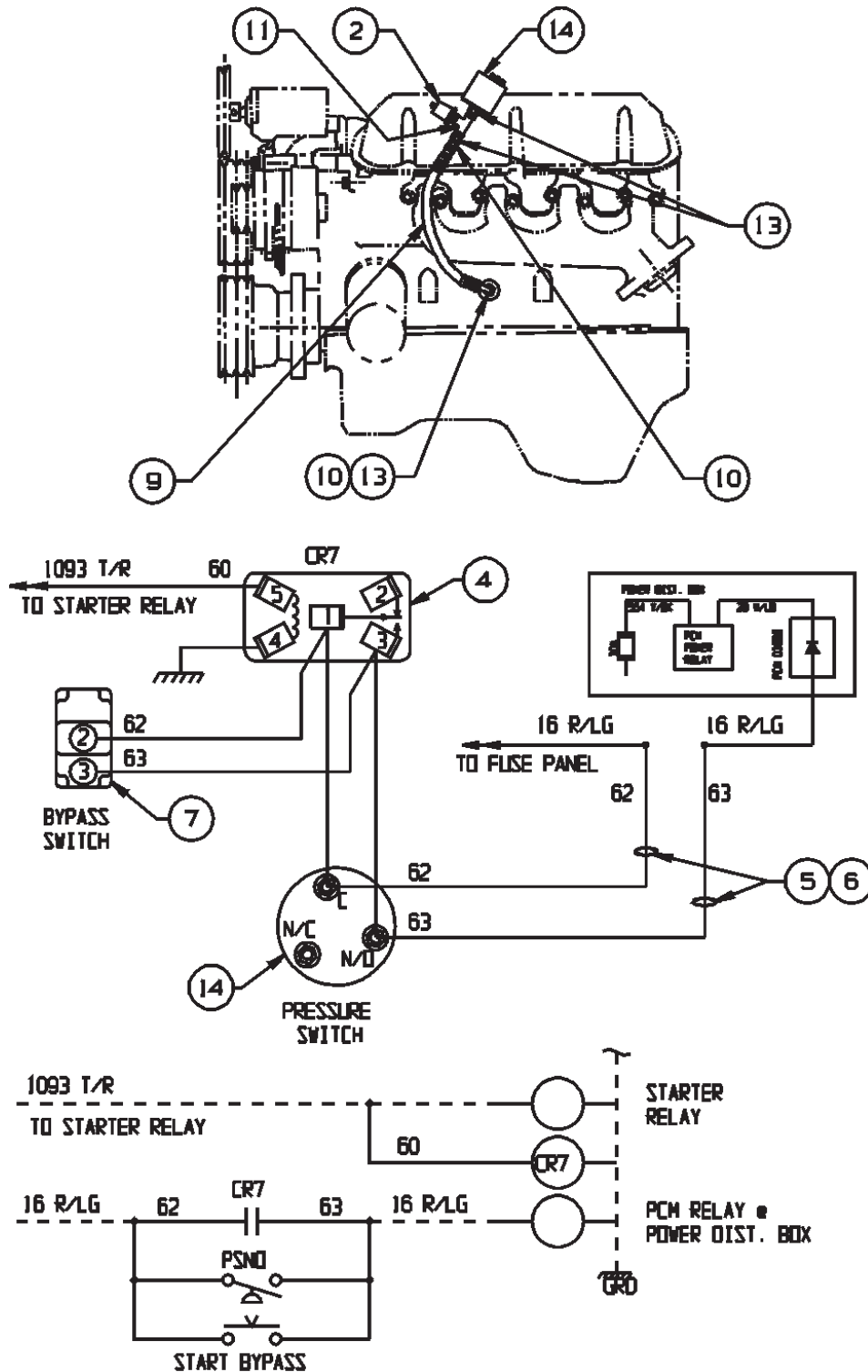


FIGURE 46.
LOW OIL PRESS SHUTDOWN, OPTION 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
46-	301298-1		Low Oil Pressure Shutdown Option, Gas, 96/97	A	Ref
1	301298		Low Oil Pressure Shutdown		
2			Oil Pressure Sender		1
4	2-1401		Relay, 70-902 12V		1
5	2-2612		Wire, Primary Black 16 Gallon		20'
6	2-3478		Conduit, Flexguard 1/4		10'
7	2-3550		Toggle Switch		1
8	562A347		Placard, Low Oil Bypass		1
9	14762.8		Hose, 1/4 x 25.99 Lg		1
10	3-1352		Nipple, 1/8 Pipe to 1/4 Tube		2
11	3-0802		Tee, 1/4 NPT		1
13	3-2283		Bushing		3
14	2-3707		Pressure Switch		1



301298-2

FIGURE 47.
LOW OIL PRESSURE SHUTDOWN OPTION, GAS, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
47-	301298-2		Low Oil Pressure Shutdown Option, Gas, 99 & Later	B	Ref
1	301298		Option, Low Oil Shutdown		Ref
2			Ford Pressure Switch		Ref
4	2.3648		Relay (Use SB502 for repairs)		1
5	2.2612		Wire, Black, 16 Gallon		240"
6	2.3478		Conduit, Flexguard, 1/4"		120"
7	2.3550		Switch		1
8	562A347		Placard, Low Oil Bypass		1
9	14762.8		Hose Assembly, #4 x 26.0 Lg		1
10	3.1352		Fitting, Hydraulic, ST, 1/8 NPT x 1/4 Tubing		2
11	3.0802		Fitting, Hydraulic, Tee, 1/4 NPT		1
13	3.2283		Fitting, Hydraulic, Bushing		3
14	2.3707		Pressure Switch, SP2C-8F-8PSI		1

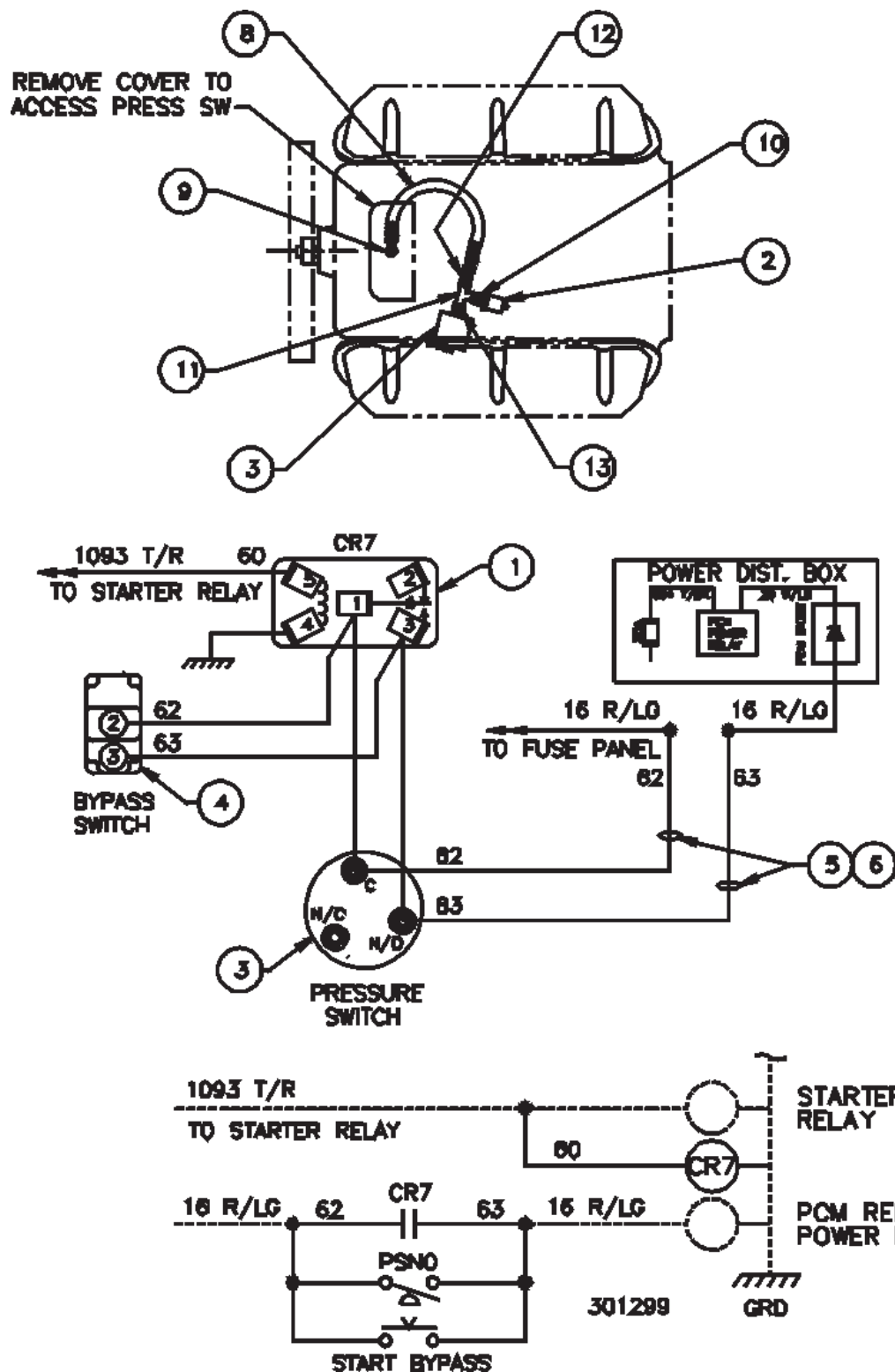


FIGURE 48.
LOW OIL SHUTDOWN OPTION, DIESEL F350/F450, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
48-	301299		Low Oil Shutdown Option, Diesel, F350/F450, 99 & Later	B	Ref
1	2.3648		Relay (Use SB502 for repairs)		1
2			Ford Pressure Switch		Ref
3	2.3707		Pressure Switch, SP2C-8F-8PSI		1
4	2.3550		Switch, Toggle		1
5	2.2612		Wire, Bk, 16 GA		240"
6	2.3478		Conduit, Flexguard, 1/4"		140"
7	562A347		Placard, Low Oil Bypass		1
8	14762.7		Hose Assy. #4 x 17" ST/90		1
9	305794		Ftg, Hyd, 04MJ-02MB		1
10	301232		Ftg, Hyd, 02FB-04MP		1
11	3.0802		Ftg, Hyd, Tee, 04FP-04FP-04FP		1
12	91925		Ftg, Hyd, 04MJ-04MP		1
13	3.2283		Ftg, Hyd, 04MP-02FP		1

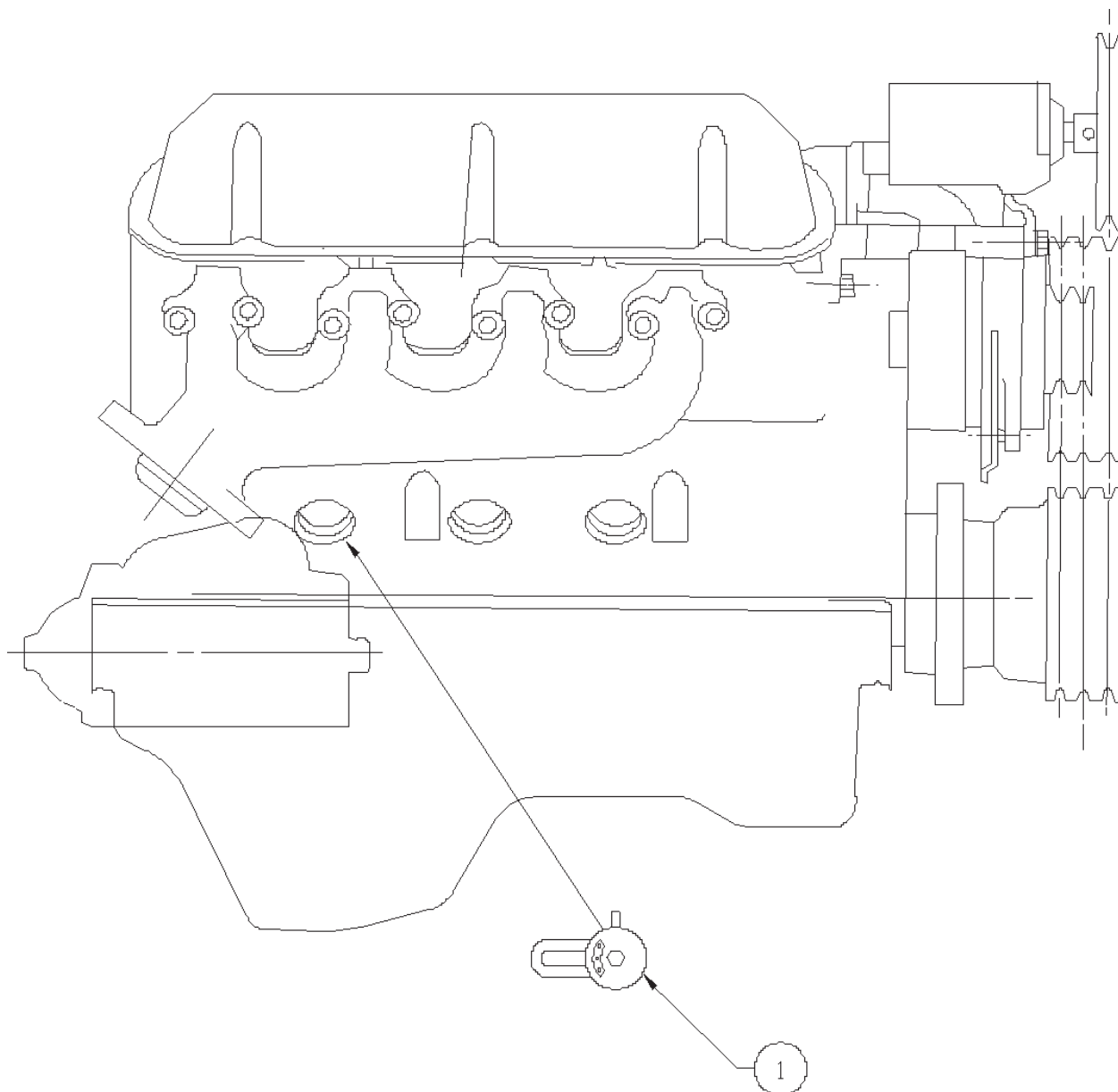


FIGURE 49.
BLOCK HEATER OPTION, GAS, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
49-	303739		Block Heater Option, Gas, 99 & Later	B	1
1	303732		Heater, Block, Engine, Gas		1

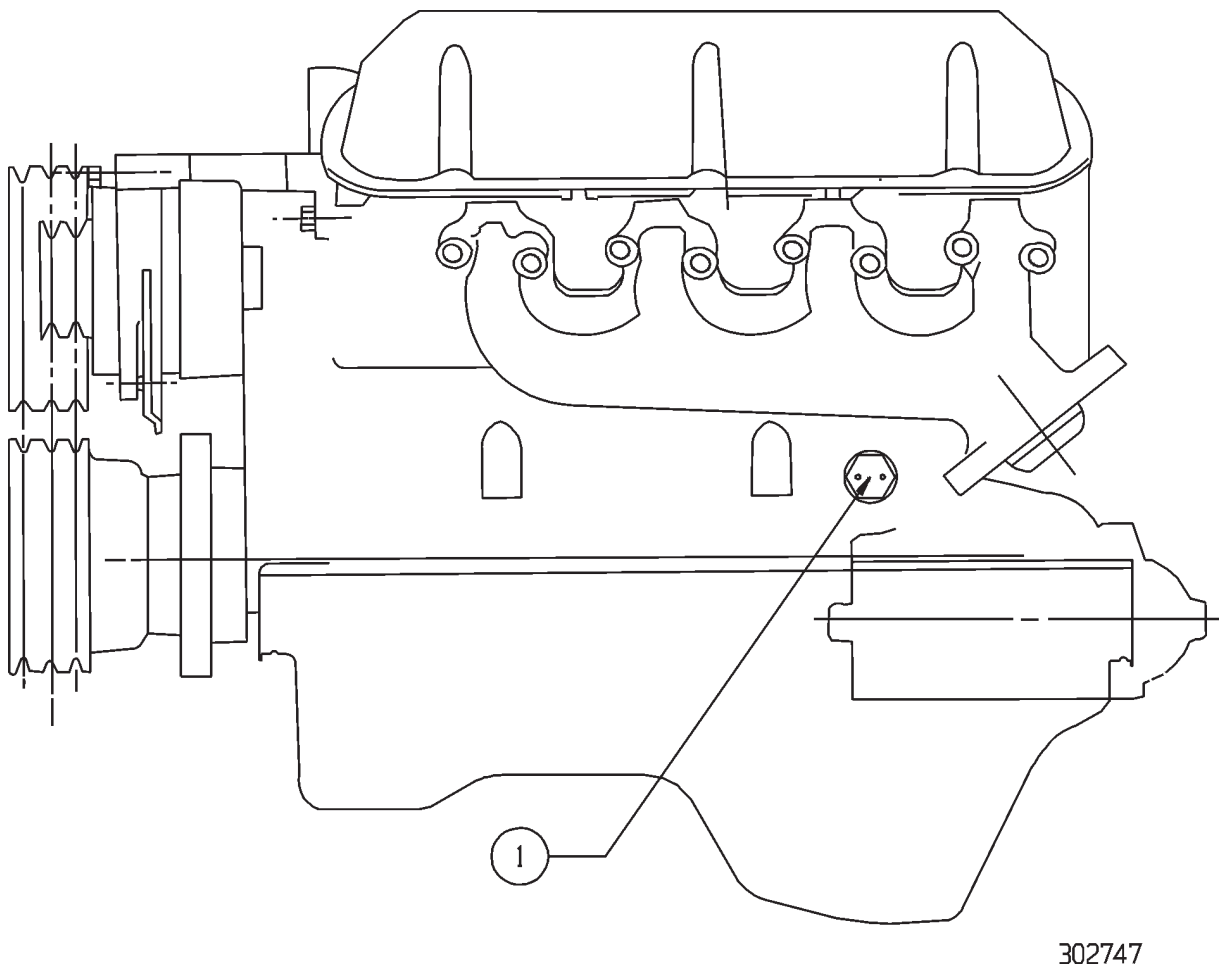


FIGURE 50.
BLOCK HEATER OPTION, DIESEL, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
50-	302747		Block Heater Option, Diesel, 96/97	A	Ref
1	301098		Heater, Block, F350/V8		1

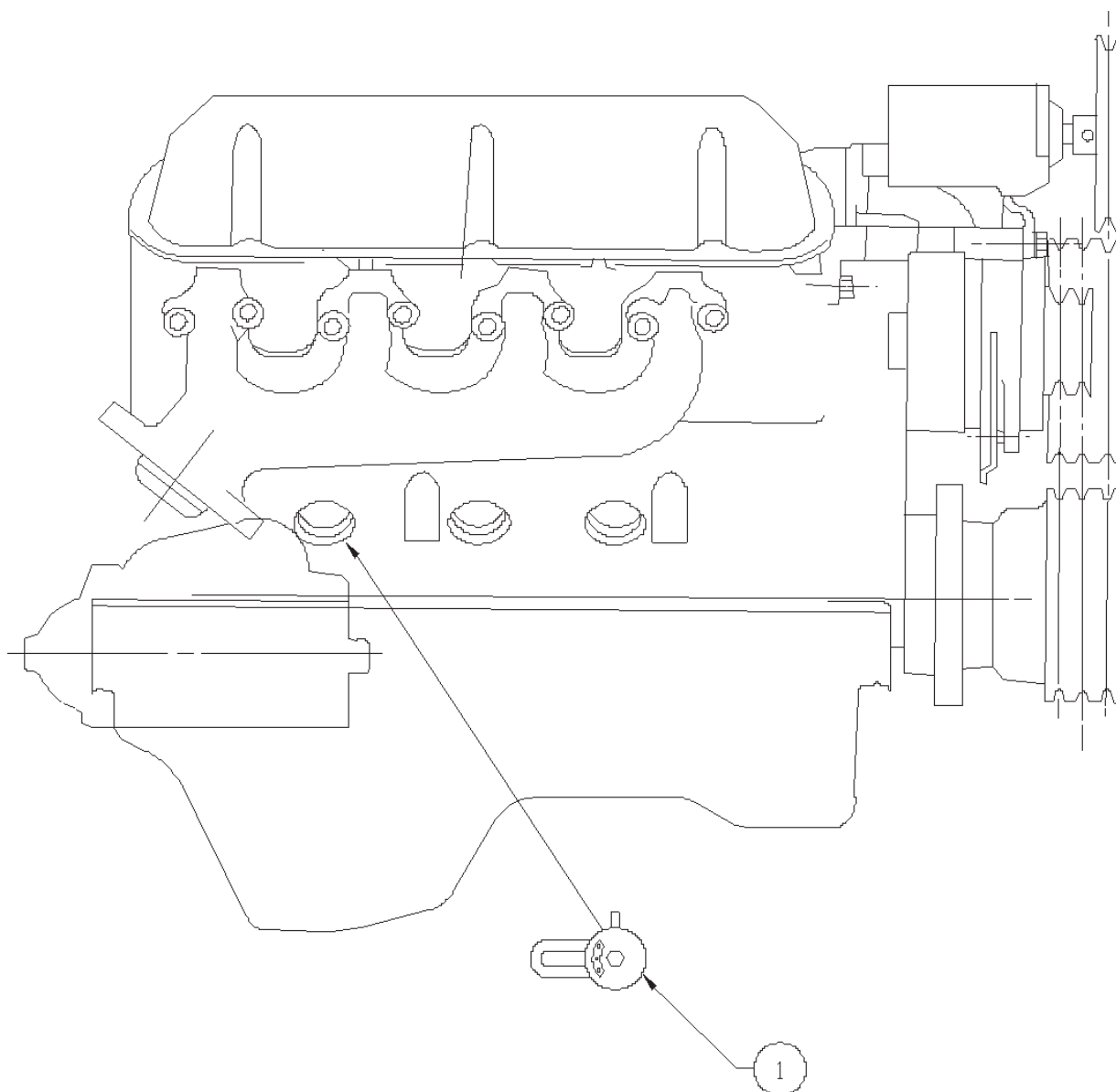


FIGURE 51.
BLOCK HEATER OPTION, GAS, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
51-	301097		Block Heater Option, Gas, 96/97	A	Ref
1	NW034240		Heater, Block, F350/V8		1

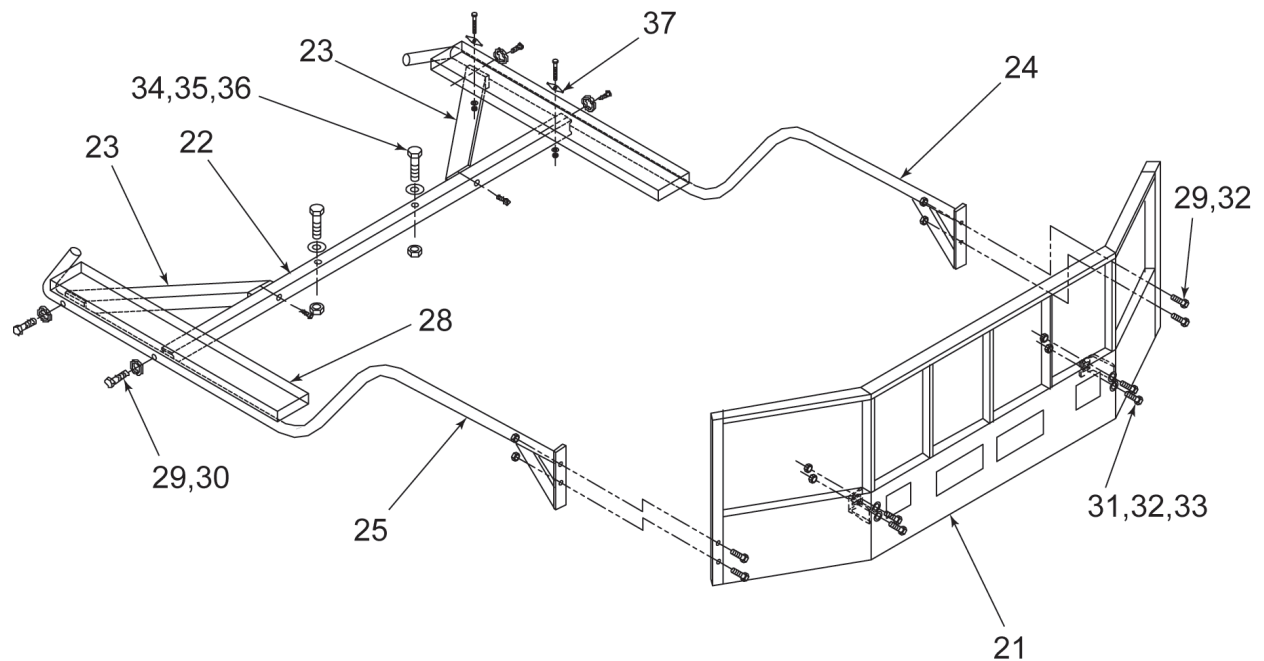


FIGURE 52.
BUMPER, HEAVY DUTY OPTION, F350, 1999-2000
1 OF 4

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
52-	303814		Bumper, Heavy Duty, Option, 99-00	B	1
21	303930		Weldment, Bumper, Heavy Duty		1
22	303925		Weldment, Support, Bumper, Heavy Duty		1
23	303921		Gusset, Weldment		2
24	303949		Rubrail, LH, Bumper, Heavy Duty		1
25	303953		Rubrail, RH, Bumper, Heavy Duty		1
26	303950		Bar, Mounting, Rubrail, Bumper, Heavy Duty		2
27	303951		Gusset, Rubrail, Bumper, Heavy Duty		2
28	304705		Gripstrut Weldment		2
29	Comm		HHCS 1/2-13X 3.0		
30	Comm		Lockwasher 1/2"		
31	Comm		HHCS 1/2-13 x 2.0		
32	Comm		Nyloc Hex Nut 1/2-13		
33	Comm		Flatwasher 1/2"		
34	Comm		HHCS 5/8-11 x 3.5		
35	Comm		Nyloc Hex Nut 5/8-11		
36	Comm		Flatwasher, 5/8"		
37	1.5782		Gripstrut Anchor		4

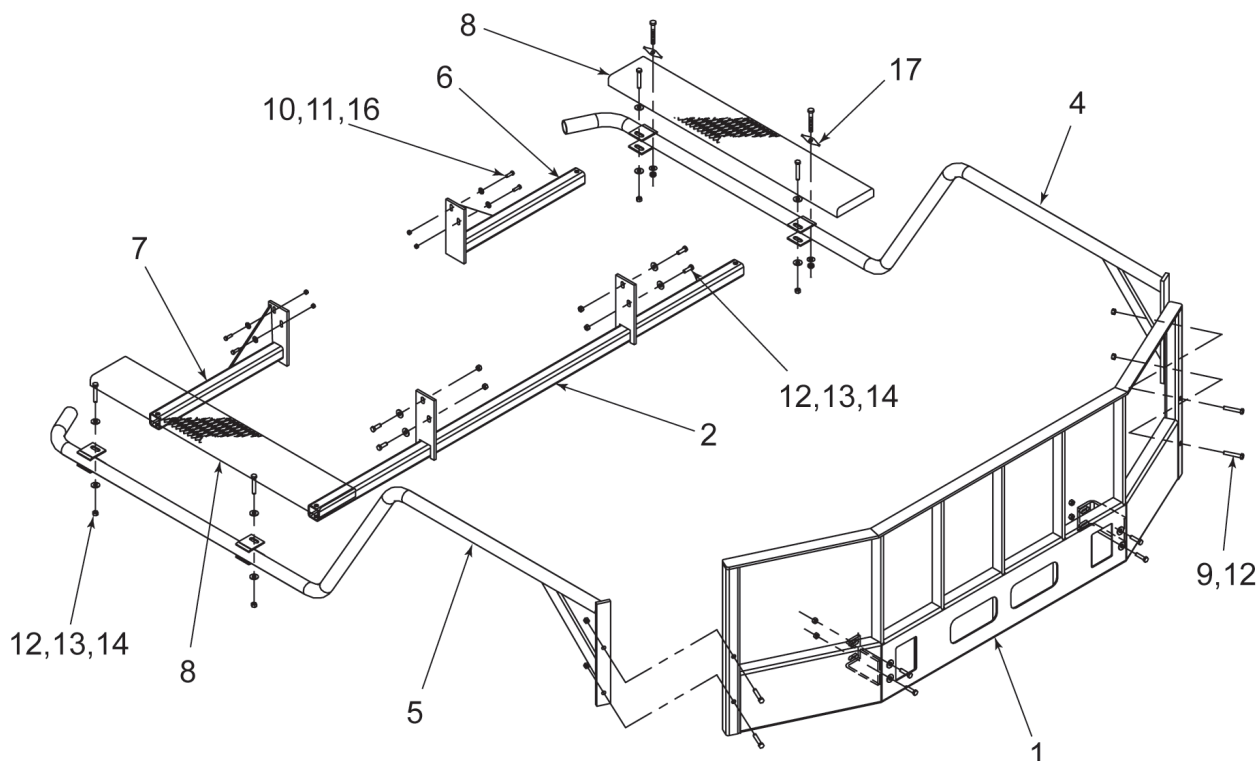


FIGURE 52.
BUMPER HEAVY DUTY, OPTION, F350, 2000+
2 OF 4

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
52-	303814		Bumper, Heavy Duty, Option, 2000+	C	1
1	306389		Weldment, Bumper, Heavy Duty		1
2	306391		Weldment, Support, Rubrails		1
4	306399		Rubrail, LH, Bumper, Heavy Duty		1
5	306400		Rubrail, RH, Bumper, Heavy Duty		1
6	306394		Support, Weldment, Rear L.H		2
7	306395		Support, Weldment, Rear R.H		2
8	304705		Gripstrut Weldment		2
9	Comm		HHCS 1/2-13X 3.0		10
10	Comm		Nyloc hex Nut 3/8-16		4
11	Comm		Flatwasher, 3/8"		4
12	Comm		Nyloc Hex Nut 1/2-13		12
13	Comm		Flatwasher 1/2"		12
14	Comm		HHCS 1/2-13 x 1.5		4
15	Comm		HHCS 1/2-13 x 3.25		4
16	Comm		HHCS 3/8-16 x 1.25		4
17	1.5782		Gripstrut Anchor		4

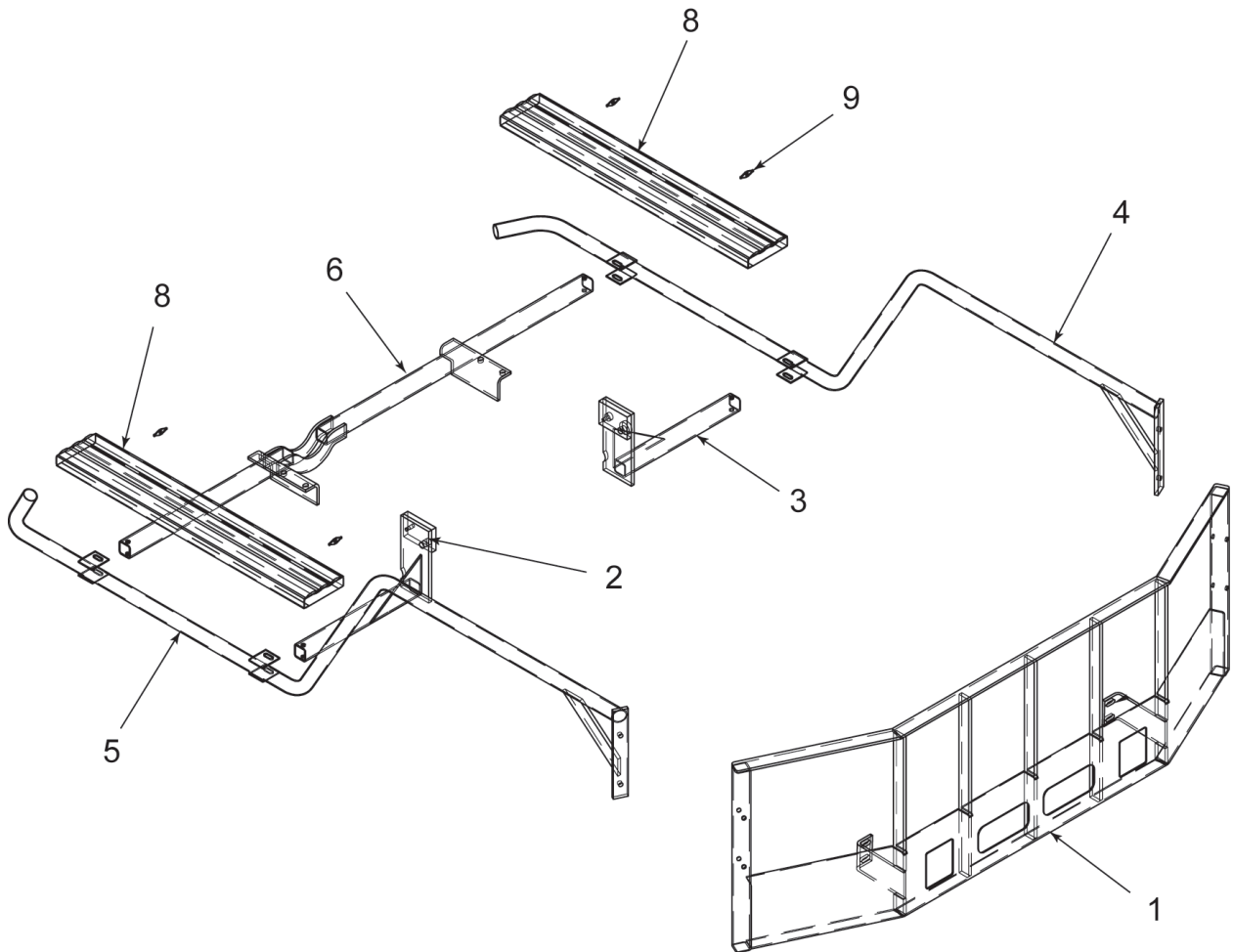


FIGURE 52.
BUMPER HEAVY DUTY, OPTION, F350, 2009+
3 OF 4

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
52-	303814		Bumper, Heavy Duty, Option, 2009+	I	1
1	309175		Weldment, Bumper, Heavy Duty		1
2	309173		Support, Weldment, RH, Frt. Rubrails		1
3	309174		Support, Weldment, LH, Frt. Rubrails		1
4	309165		Rubrail, Weldment, LH		1
5	309167		Rubrail, Weldment, RH		1
6	309177		Weldment, Support, Rear Rubrails		1
8	304705		Gripstrut Weldment		2
9	1.5782		Gripstrut Anchor		4

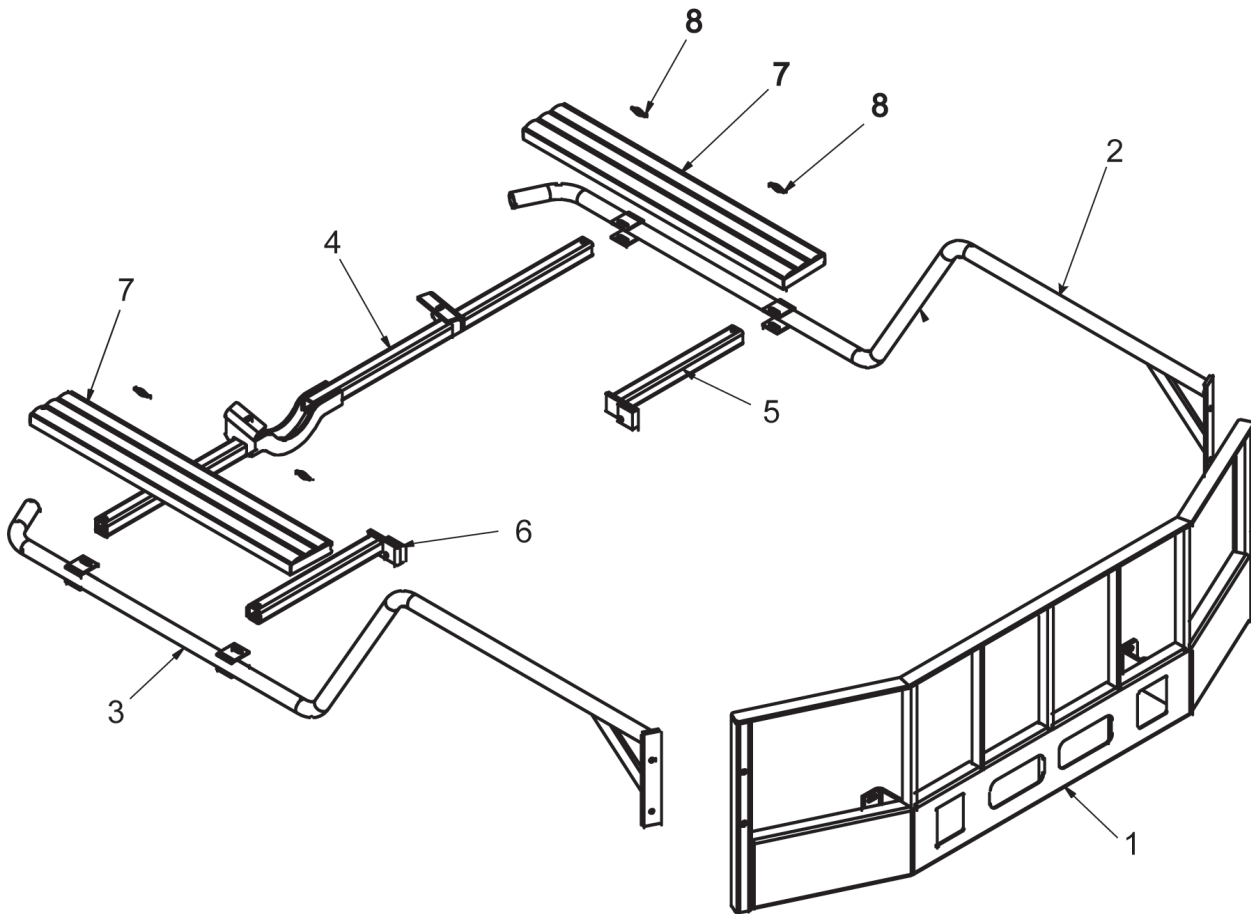
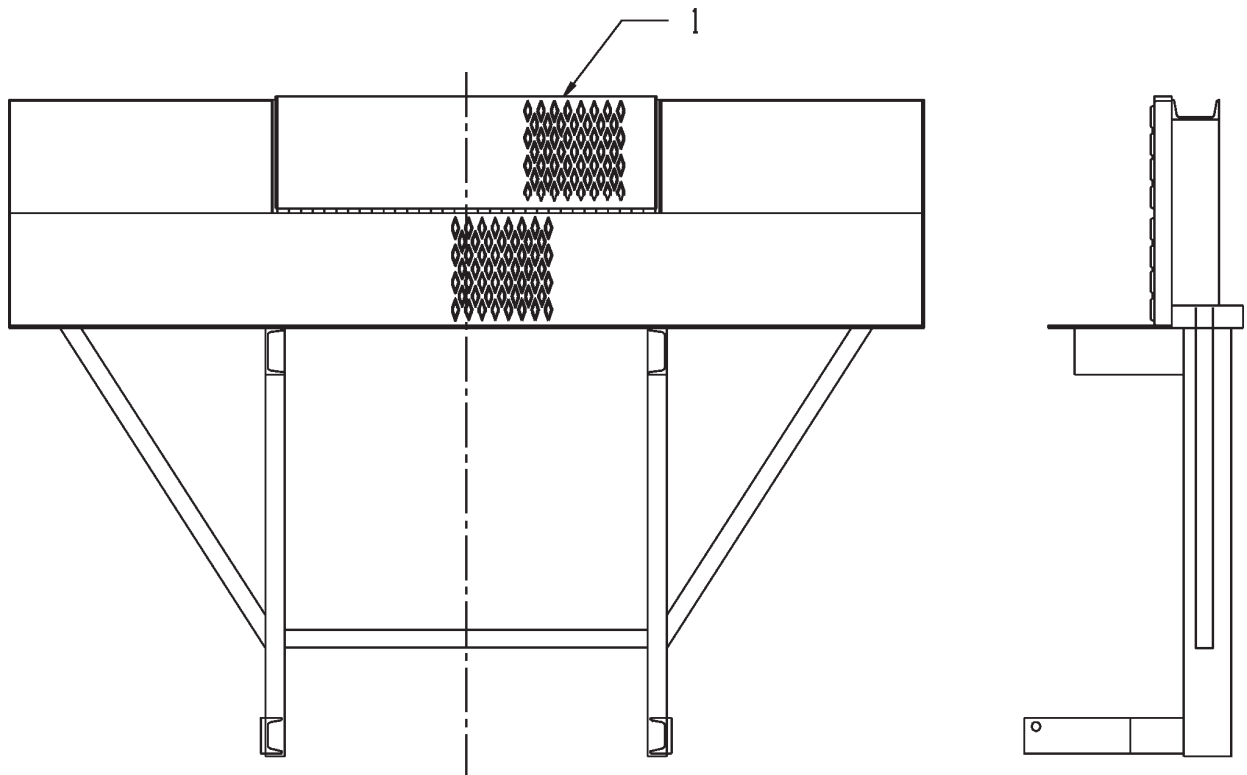


Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
52-	309735		Bumper, Heavy Duty, Option, 2010+	I	1
1	309736		Weldment, Bumper, Heavy Duty 2010+		1
2	309739		Rubrail, Weldment, LH		1
3	309740		Rubrail, Weldment, RH		1
4	309741		Support, Weldment, Rubrails, Rear		1
5	309738		Support, Weldment, LH Front Rubrail		1
6	309737		Support, Weldment, RH Front Rubrail		1
7	304705		Gripstrut Weldment w/ Endcap, 7.0 X44		2
8	1.5782		Gripstrut Anchor		4

FIGURE 52.
BUMPER HEAVY DUTY, OPTION, F350, 2010+
4 OF 4



**FIGURE 53.
BUMPER W/ PLATFORM, REAR OPTION**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
53-	13657		Bumper w/Platform, Rear, Option	B	Ref
1	304860		Bumper Weldment, Rear w/Platform		1

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
53-	308649		Bumper Assy w/Platform, Rear, Option		Ref
1	308650		Bumper Weldment, Rear w/Platform		1
NS	305577		Angle, Bumper Mnt, Rear		2

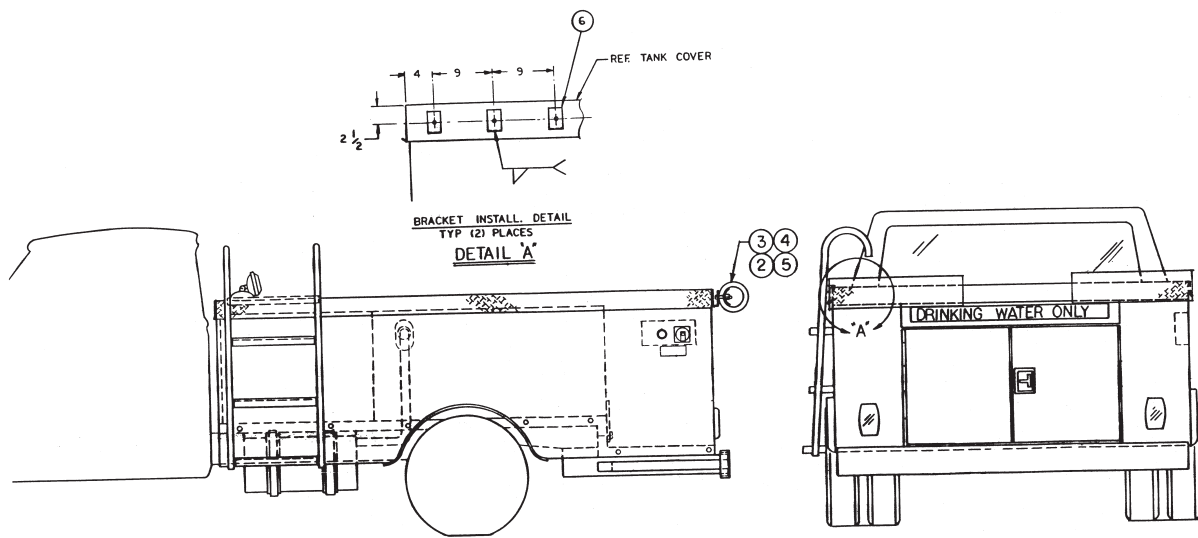


FIGURE 54.
BUMPER, RUBBER, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
54-	13372		Bumper, Rubber, Option		Ref
2	6859.08		Bumper		2
3	6859.12		Clamp		2
4	Comm		Bolt, Hex		6
5	13377		Bracket		6

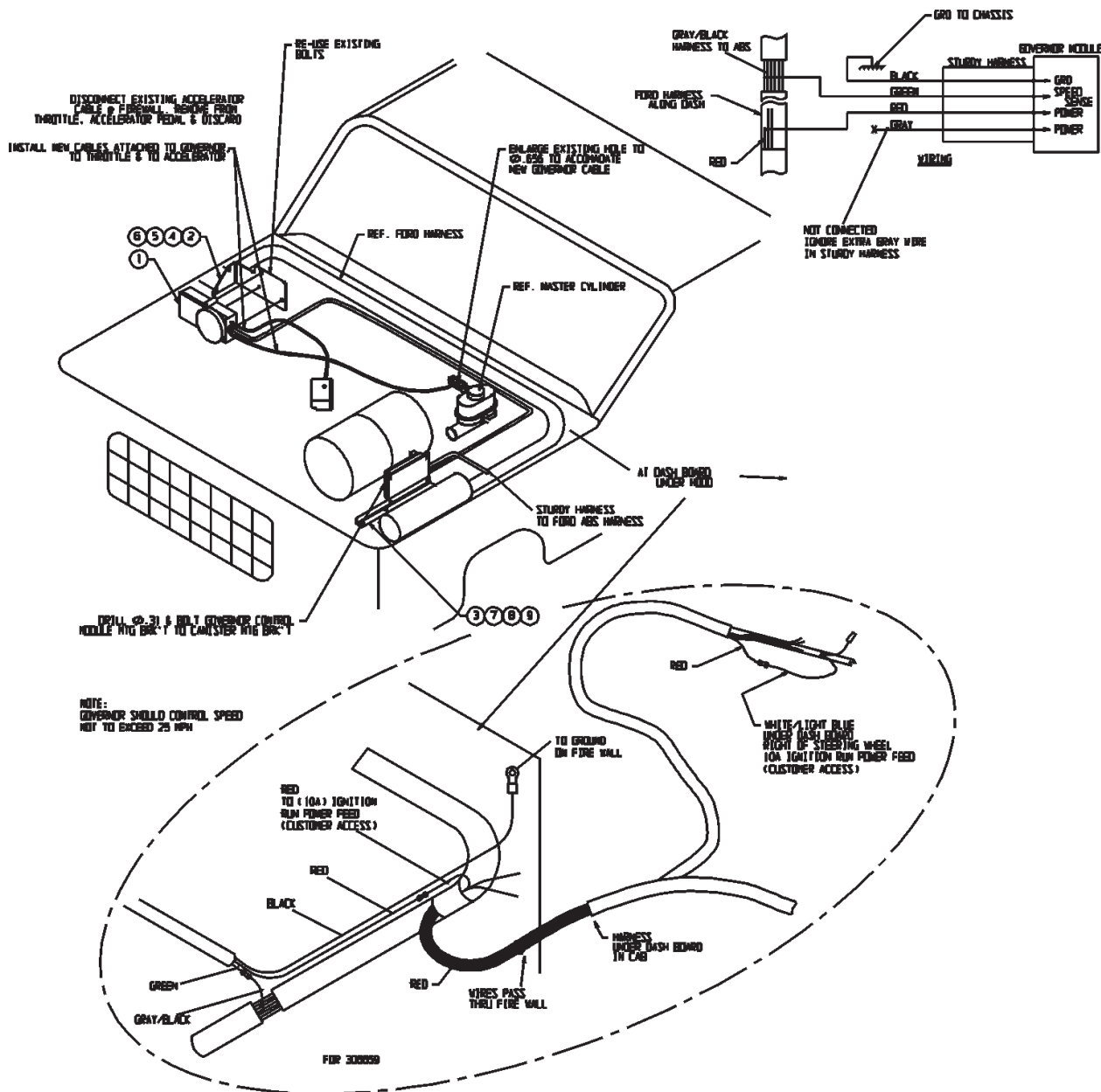


FIGURE 55.
GOVERNOR WITH FUEL INJECTION, OPTION, 99 & LATER
GOVERNOR, 350/V8 GAS, OPTION 02 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
55-	303826		Governor with Fuel Injection Option, 99 & Later	B	Ref
1	303827		Governor, F350, 1999 and later		1
2	303675		Bracket, Bov. Control Mtg		1
3	303748		Bracket, Governor Module Mount		1
4	153803		E HHCS, M8 x 1.25 x 25mm		2
5	F9549		E FW, 5/16		2
6	F9546		E LW, 5/16 Reg.		2
7	F17264		E HHCS, 1/4-20 x 1.0, Gr.5		4
8	F9535		E LW, 1/4 Reg.		4
9	F9536		E Nut Hex, 1/4-20		4

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
55-	306659		Governor, 350/V8 Gas, Option 02+		Ref
1	306764		Governor, F350/V8, 25 mph, 02+		1
2	307136		Mount, Gov Ctrl, 02 F350		1
3	307122		Mount, Gov Module, 02 F350		1
4	153803		HHCS M8 x 1.25 x 25mm, DN 933		2
5	F009549		FW 5/16		2
6	F009546		LW 5/16 Reg		2
7	F100360		HHCS 1/4-20 x 1-1/2, GR5		4
8	F009535		LW 1/4 Reg		4
9	F009536		Nut Hex 1/4-20		4

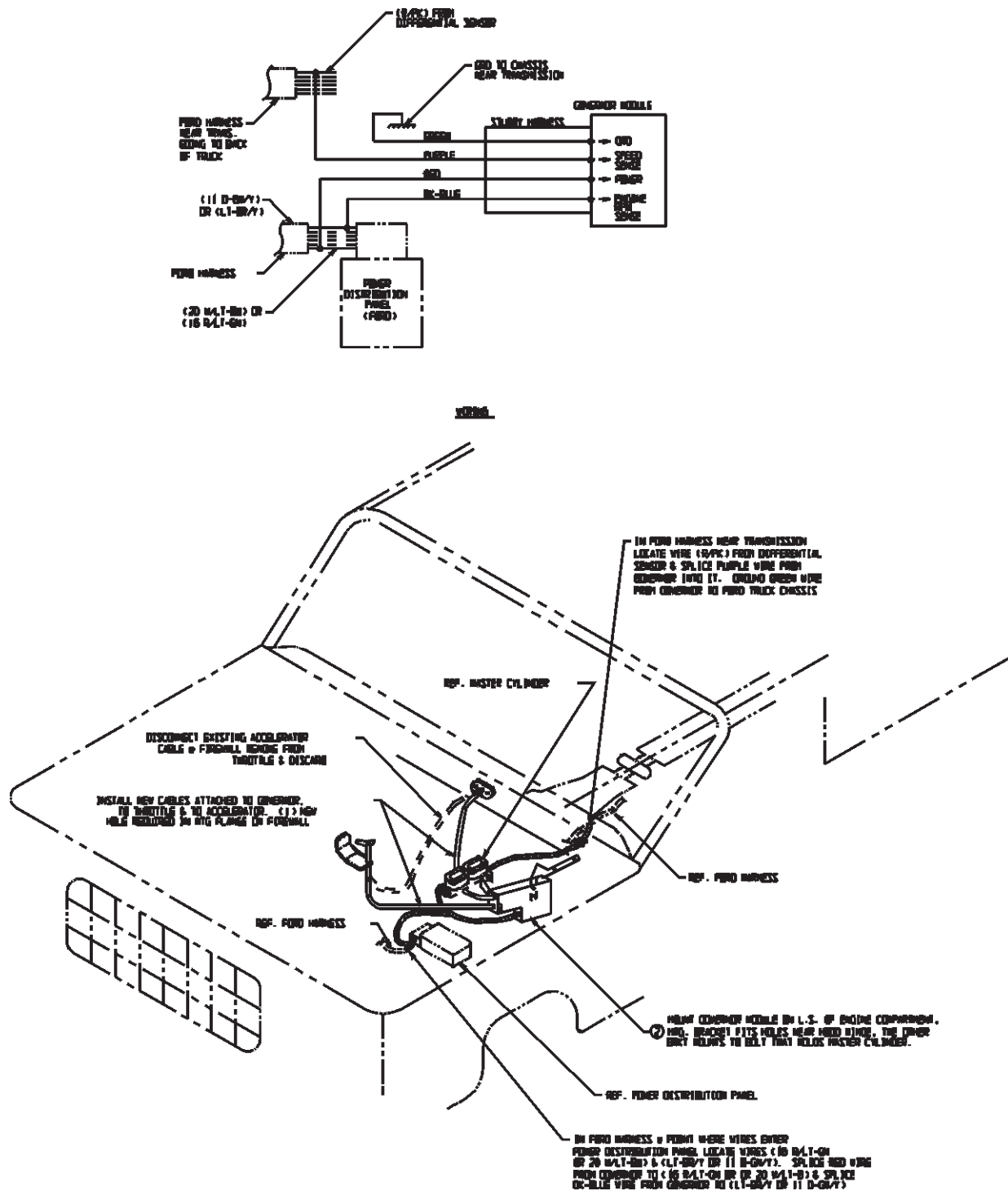


FIGURE 56.
GOVERNOR OPTION F350, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
56-	300812		Governor Option F350, 96/97		Ref
2	300813		Governor, F350V8 20MPH		1

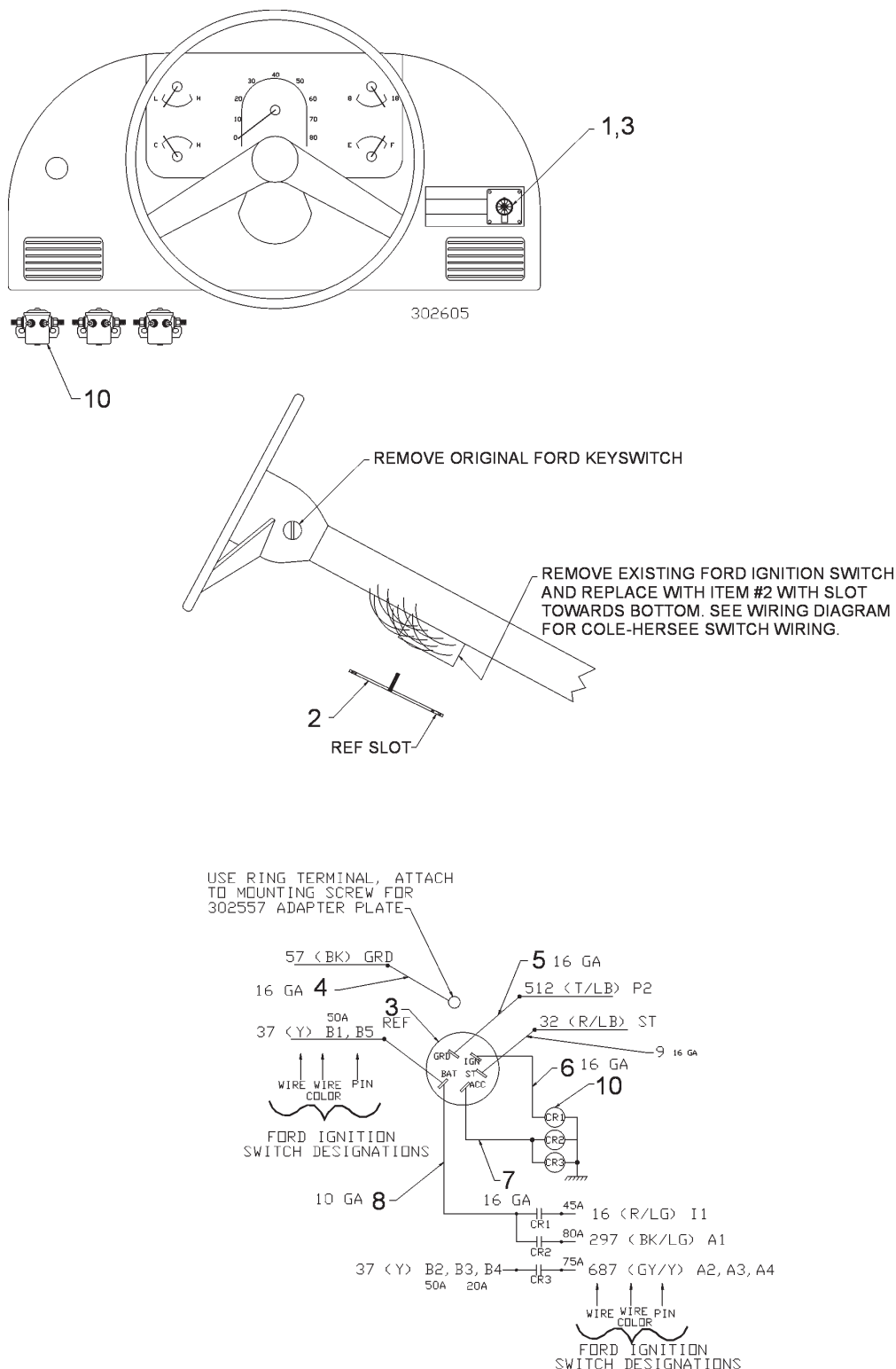


FIGURE 57.
SWITCH, IGN, OPTION, COLE HERSEE, 1997 & EARLIER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
57-	302605		Switch, Ignition, Option, Cole Hersee, 1997 & Earlier	A	Ref
1	302557		Plate Adapter, Keyswitch Mtg.		1
2	302559		Brkt Weldment		1
3	2.3500		Switch, Ignition (Cole Hersee)		1
4	2.2612		Wire, 16 GA, Blk J1128 GPT SAE		24"
5	2.2633		Wire, 16 GA, Wht J1128 GPT SAE		24"
6	F009792		Wire, 16 GA, Y		24"
7	2.2613		Wire, 16 GA, Blu J1128 GPT SAE		24"
8	2.0865		Wire, 10GA, Blk J1128 GPT SAE		24"
9	2.2568		Wire, 16 GA, Red		24"
10	2.1401		Relay		3

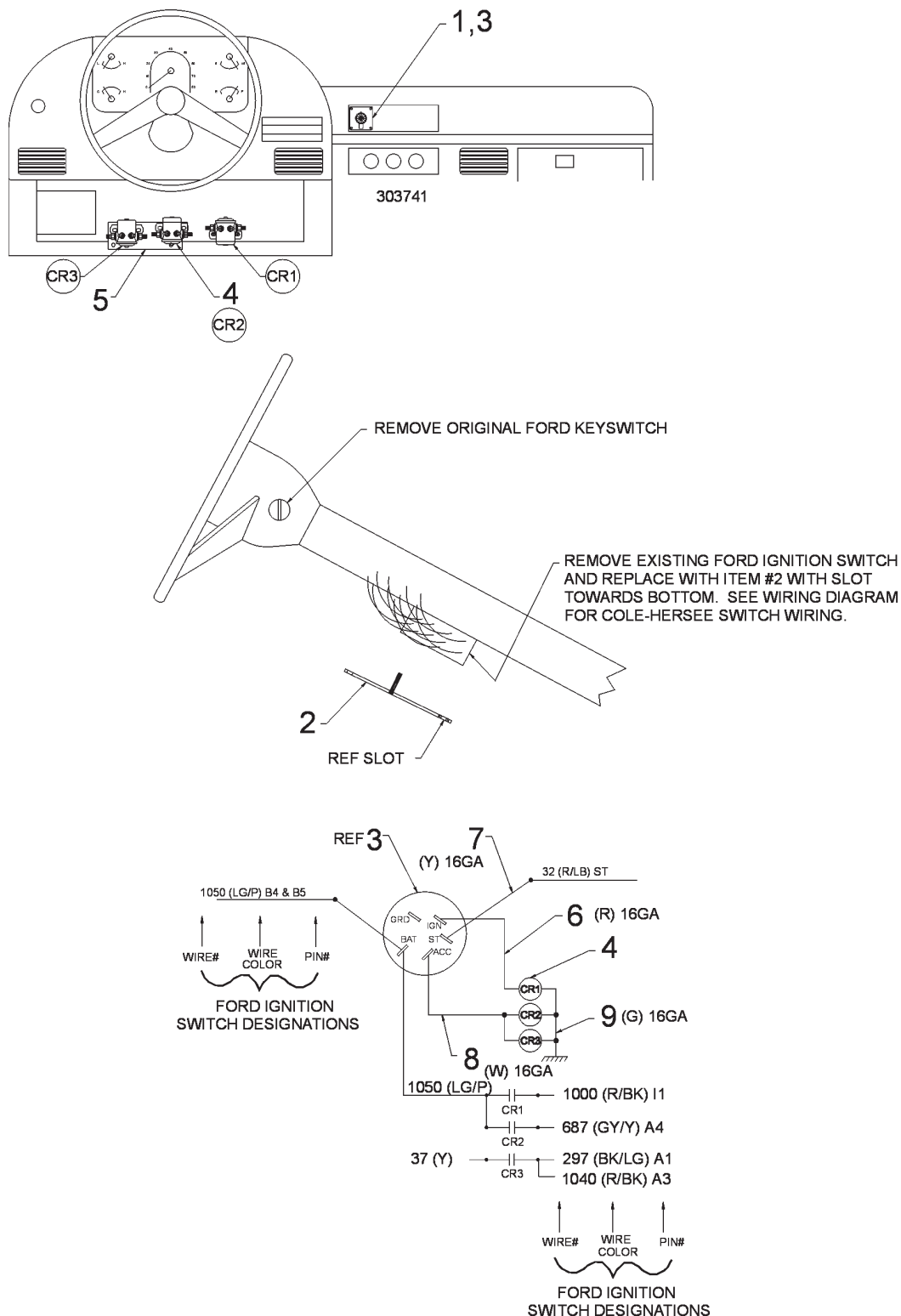


FIGURE 58.
SWITCH, IGNITION, OPTION, COLE HERSEE, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
58-	303741		Switch, Ignition, Option, Cole Hersee, 99 & Later	B	Ref
1	302557		Plate Adapter, Keyswitch Mtg.		1
2	302559		Brkt Weldment		1
3	2.3500		Switch, Ignition (Cole Hersee)		1
4	2.1401		Relay		3
5	303972		Brk't, Relay Mtg		1
6	2.2568		Wire, 16 GA, (R) J1128 GPT SAE		36"
7	F009792		Wire, 16 GA, (Y)		36"
8	2.2633		Wire, 16 GA, (W) J1128 GPT SAE		36"
9	2.1614		Wire, 16 GA, (G) J1128 GPT SAE		36"
10	F104232		Wire, 16 GA, (LG)		36"

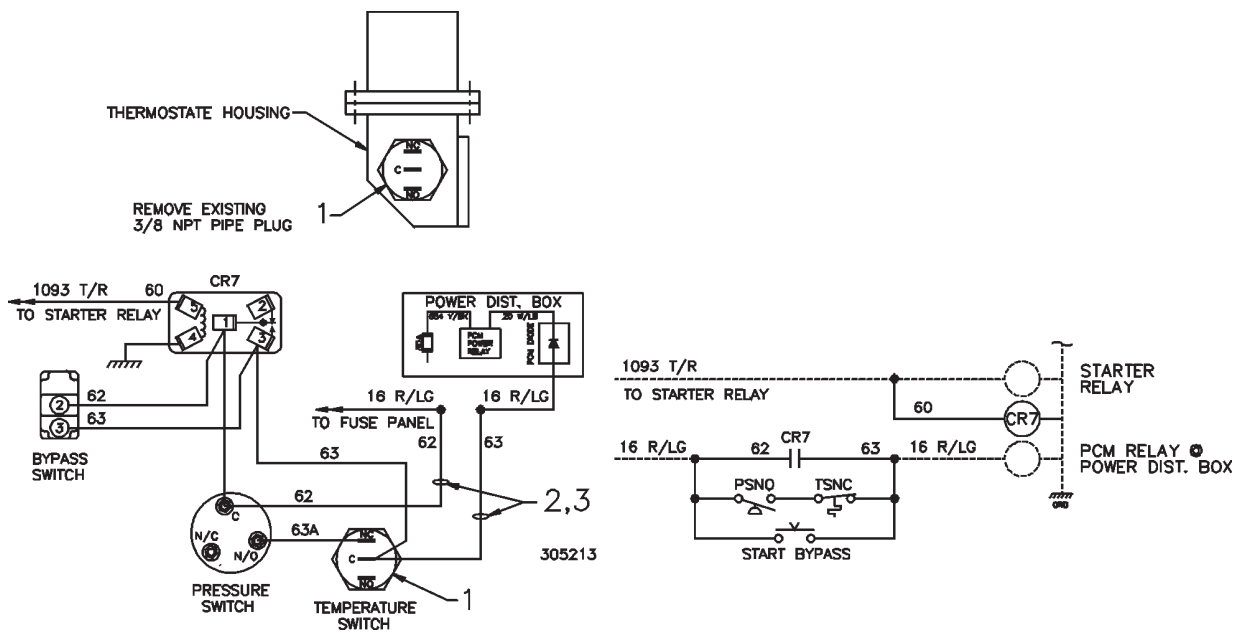


FIGURE 59.
HIGH WATER TEMP SHUTDOWN W/ LOW OIL SHUTDOWN OPT, DIESEL,
F350/F450, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
59-	305213		High Water Temp Shtdwn w/Low Oil Shtdwn Opt, Diesel, F350/F450, 99 & Later	B	Ref
1	305424		Switch, Temp, 335°, SPDT		1
2	2.1532		Wire, 14Ga, Blk, J1128 PGT SAE		60
3	2.3478		Conduit, Flexguard, 1/4"		60

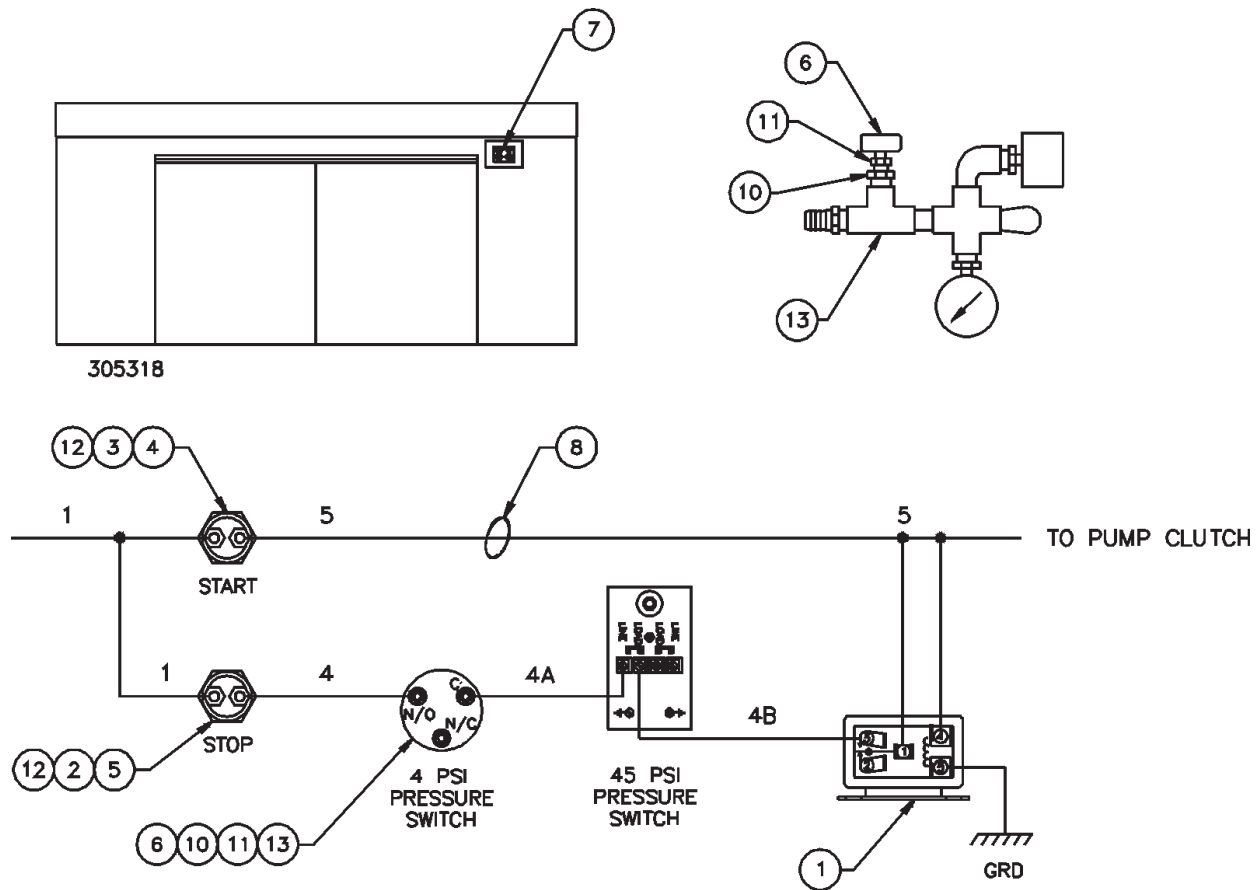


FIGURE 60.
PUSH BUTTON STATION, WATER PUMP OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
60-	305318		Push Button Station, Water Pump Option		Ref
1	2.3648		Relay, 12DC, SPDT, 15A (Use SB502 for repairs)		1
2	2.3966		Switch, Operator, Red		1
3	2.3967		Switch, Operator, Green		1
4	2.3356		Switch, N/O, Ball Operated		1
5	2.3919		Switch, N/C, Ball Operated		1
6	2.1585		Switch, Pressure, 4PSI, SPDT		1
7	305319		Decal, Pump Start/Stop		1
8	2.3478		Conduit, 1/4" Flexguard		72
9	2.3786		Connector, 1/2" Hub, 1/8" Cable		1
10	3.0558		Ftg, Pipe, Bshg, 16MP04FP		1
11	F100671		Ftg, Pipe, Bshg, 04MP-02FP		1
12	19782		Adapter, Pushbutton Switch		2
13	3.0660		Ftg, Pipe, Tee, 16FP-16FP-16FP		1

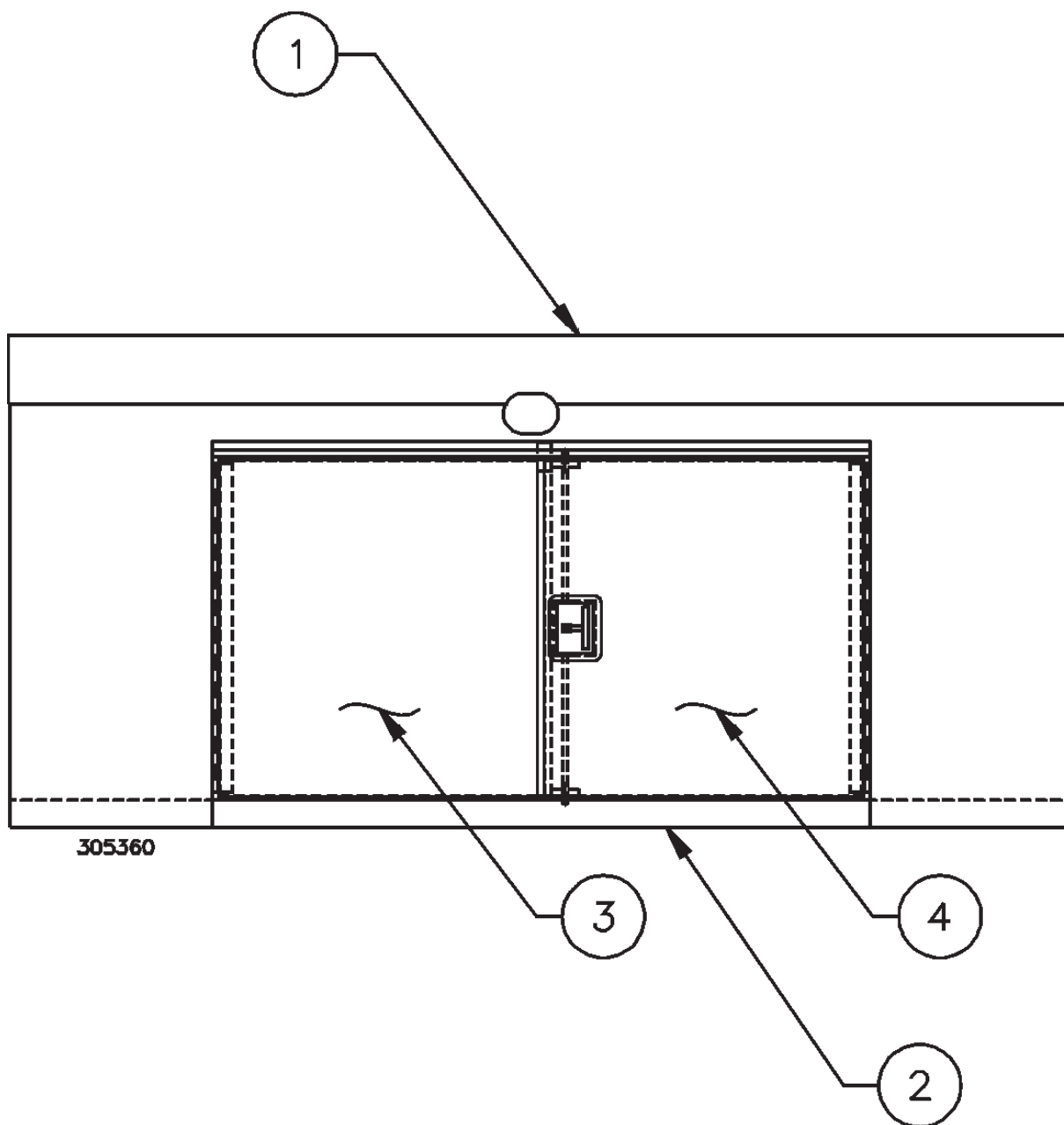


FIGURE 61.
BODY, OUTER, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
61-	305360		Body, Outer, Option, SS		Ref
1	305321		Frame, SS		1
2	305324		Tank Cover, SS		1
3	305361		Door Wldmt, L.H., SS		1
4	305362		Door Wldmt, R.H., SS		1

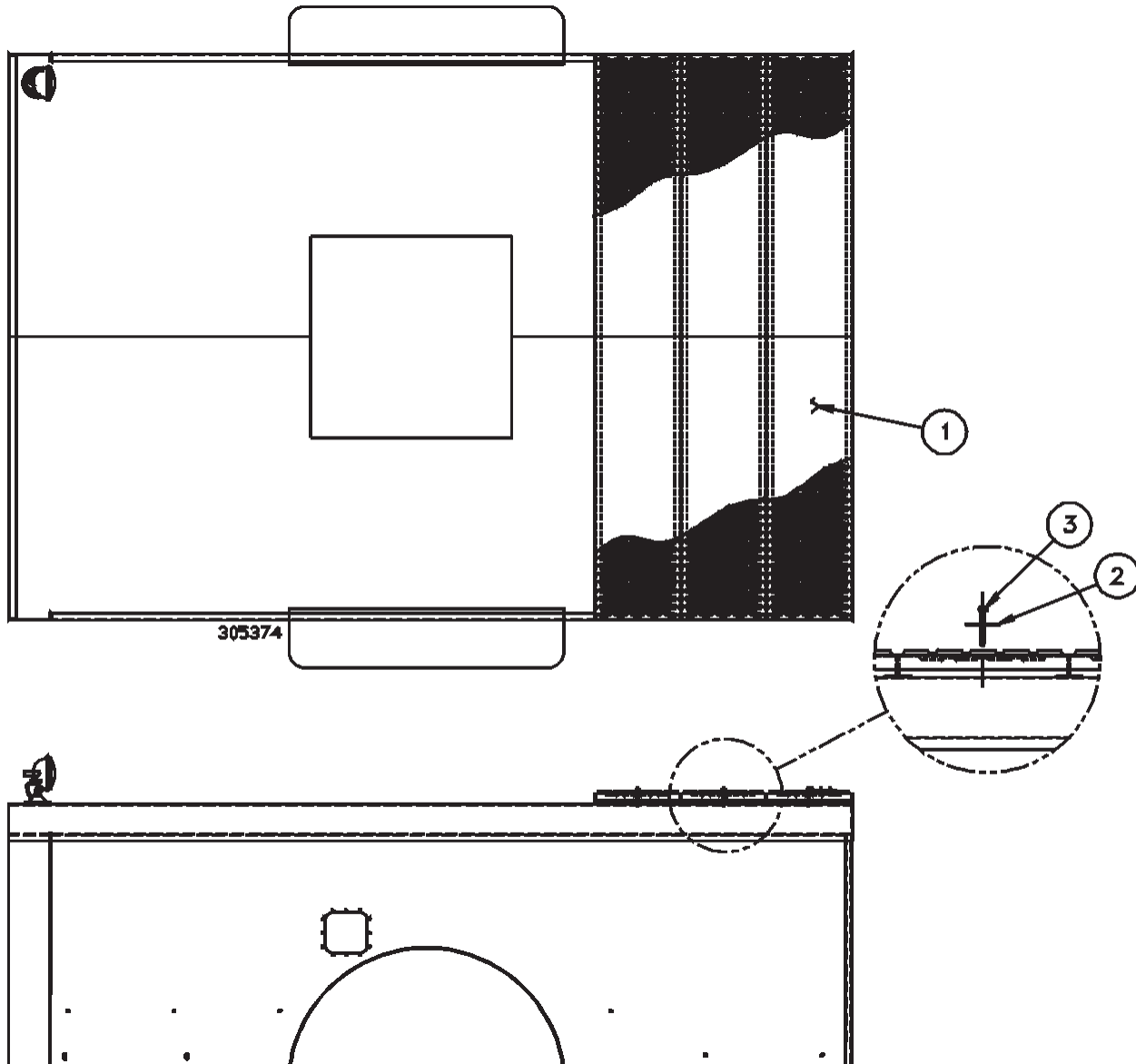


FIGURE 62.
GRIPSTRUT, TOP REAR, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
62-	305374		Gripstrut, Top Rear, Option		Ref
1	303659		Gripstrut Wldmnt, 11.75 w/Ends		3
2	1.5782		Anchor, Gripstrut		6
3	Comm		.25 Self Tapping Screw		6

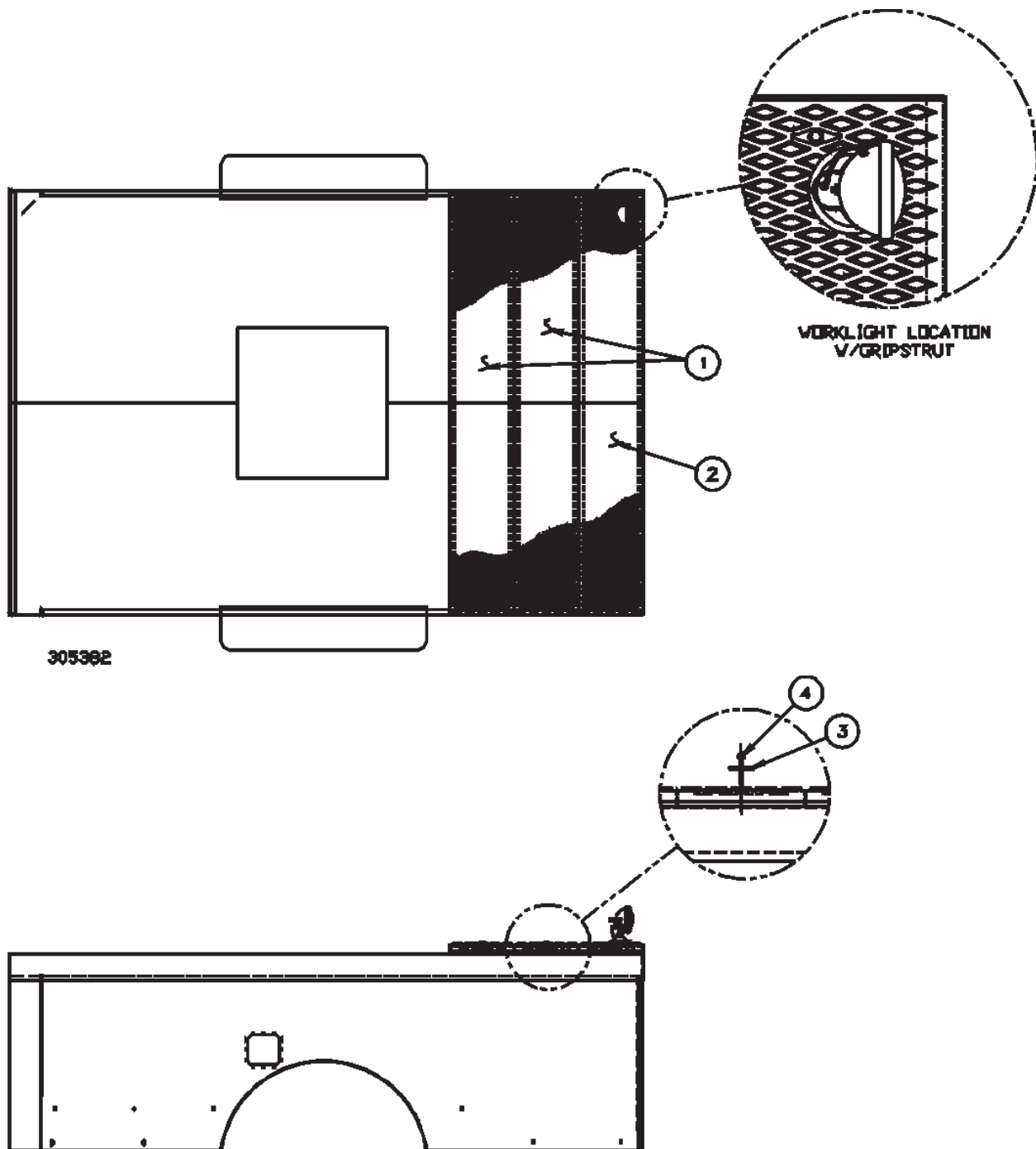


FIGURE 63.
GRIPSTRUT, TOP REAR, W/ LT OPTION, 402

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
63-	305382		Gripstrut Top Rear w/Lt Option, 402		Ref
1	303659		Gripstrut Weldment, 11.75 w/Ends		2
2	305695		Gripstrut Weldment, 11.75 w/Lt Base		1
3	1.5782		Anchor, Gripstrut		6
4	Comm		.25 Self Tapping Screw		6

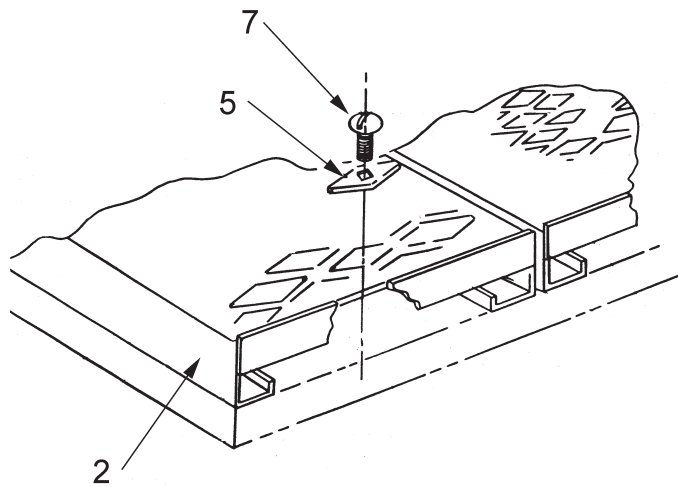
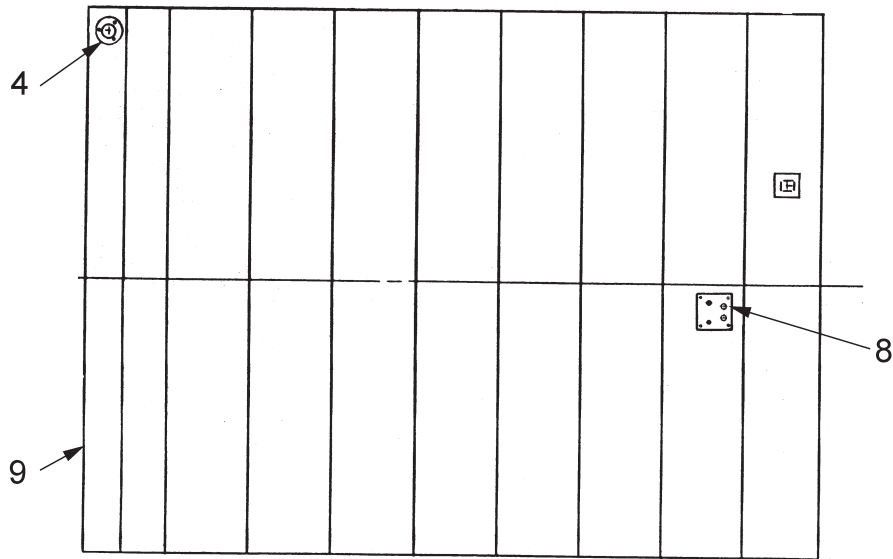


FIGURE 64.
GRIPSTRUT, OPTION, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
64-	13371		Gripstrut Option, 96/97		Ref
2	303659		Gripstrut Weldment		9
4	6855.09		Lightbase		1
5	1.5782	GS-12262	Gripstrut Anchors, 5/16" Sq. Hall		30
7	Comm		Screw, TEK		30
8	17933		Plate, Cpl'g		1
9	303662		Gripstrut Weldment		1

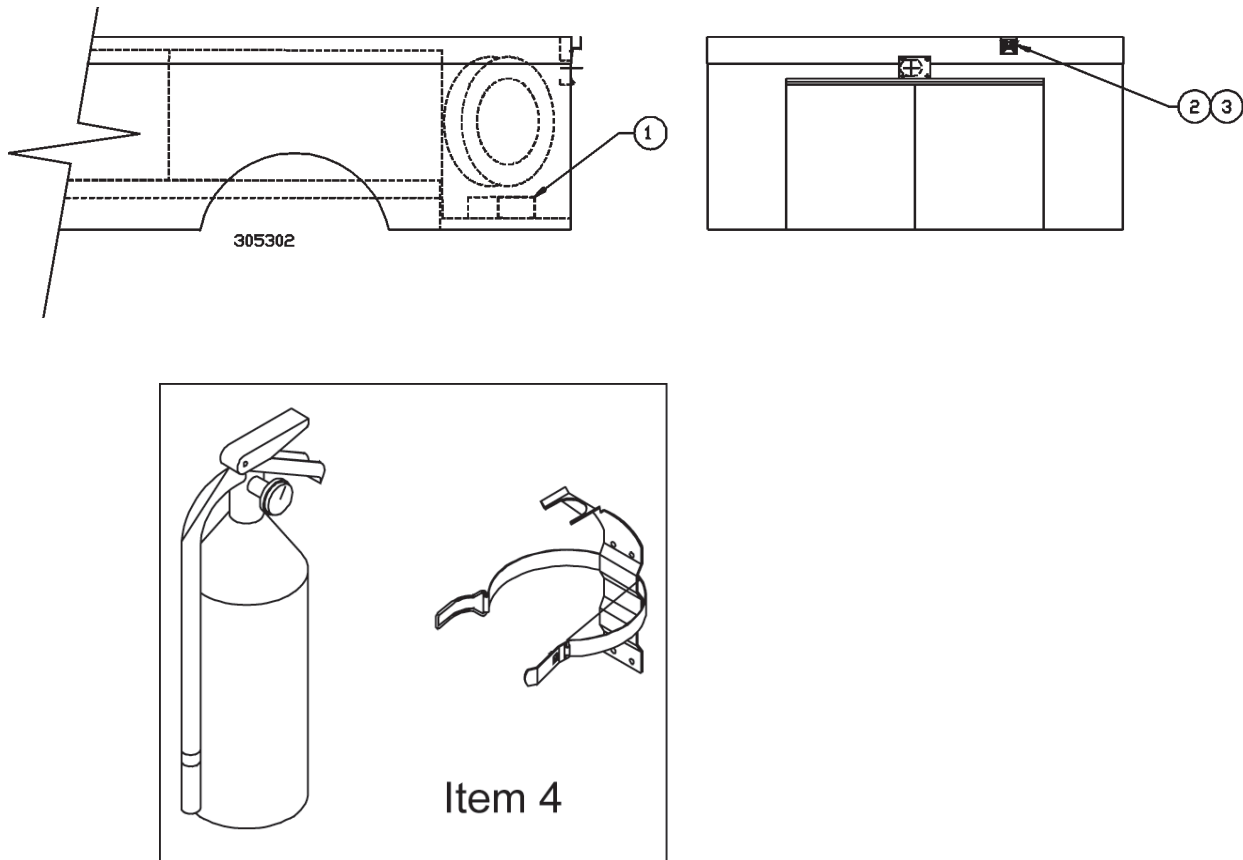


FIGURE 65.
HOSE, REAR EXIT, OPTION
FIRE EXTINGUISHER, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
65-	305302		Hose, Rear Exit Option		Ref
1	305289		Stand, Hose Reel		1
2	305355		Hanger, Water Hose		1
3	305357		Decal, Stow Water Hose Here		1
4	19251		Fire Extinguisher Option		1

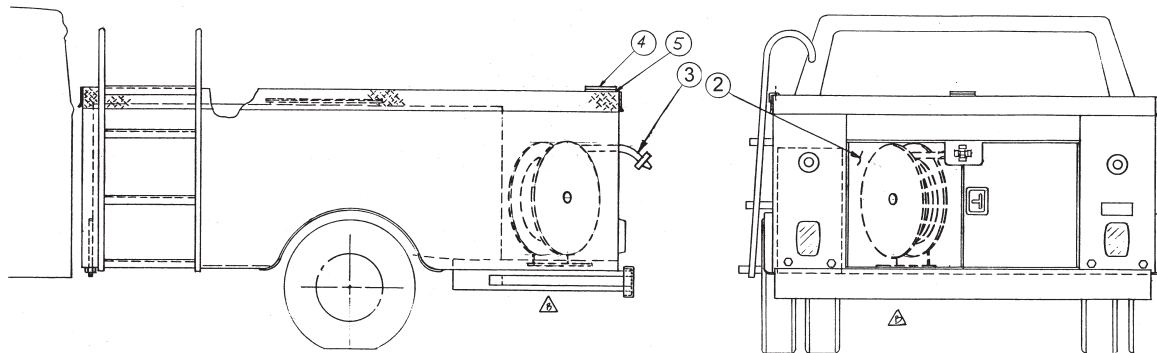


FIGURE 66.
REEL, REAR ACCESS, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
66-	14493		Reel Rear Access Option		Ref
2	14494		Door Installation		1
3	14495		Plumbing Assy		1
4	14601		Cover		1
5	90161		Neoprene, 1/8 x 4" x 4"		1

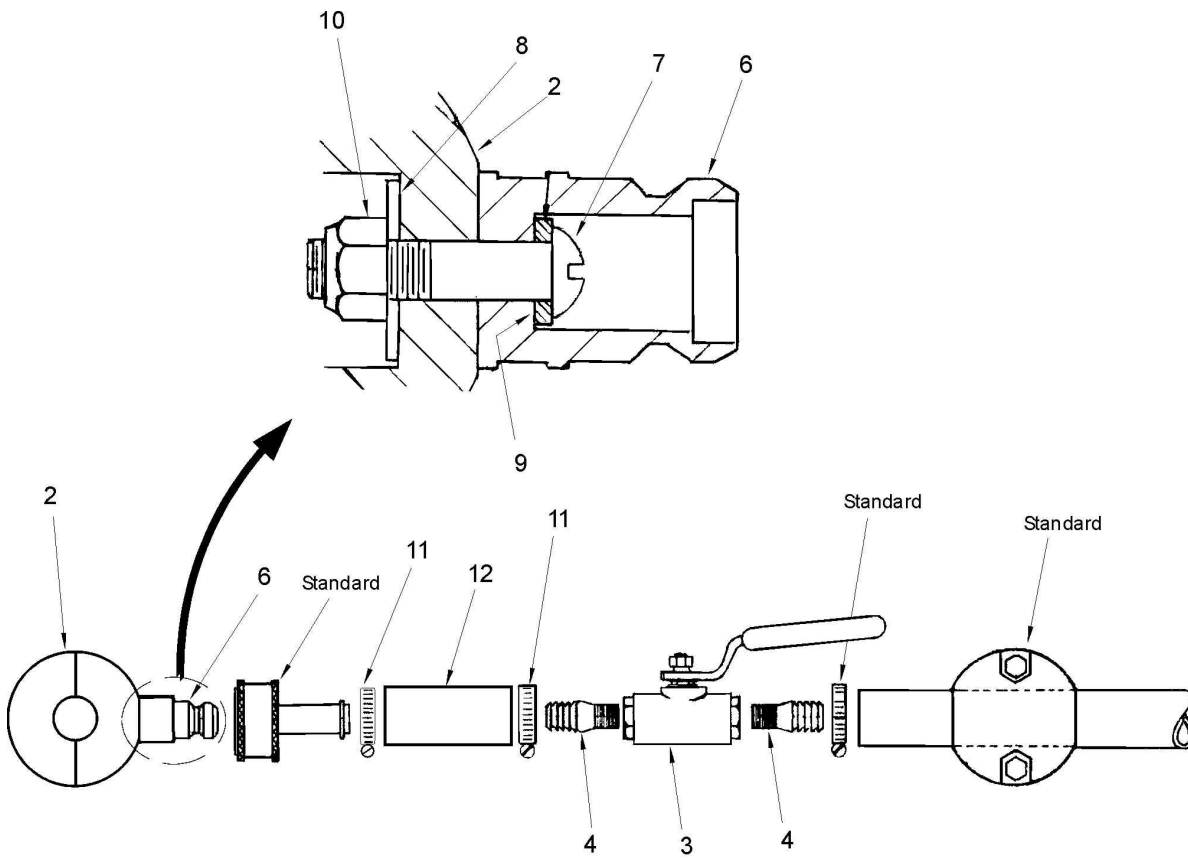


FIGURE 67.
SHUTOFF, NOZZLE END, 3/4" HOSE, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
67-	17945		Shutoff, Nozzle Eng, 3/4" Hose Option		Ref
2	9780		Stop, Ball, Modified		1
3	9781		Valve, Modified		1
4	3.0640		Nipple, 3/4NPT x 3/4 Hose, Brass		2
6	9782		Plug, Modified, Nozzle Shut-Off		1
7	3.3348		Screw, Truss Hd, S/S, 1/4-20 x 1 3/4 Lg		1
8	Comm		Washer, Flat, 1/4-20		2
9	3.3350		Washer, Flat, Nylon, .562 OD x .270 ID x .023 THK		1
10	Comm		Nut, Esna, 1/4-20		1
11	3.1084		Clamp, Hose, S/S, 9/16" - 1-1/16		2
12	9.1975		Hose Food Grade 3/4 ID		8

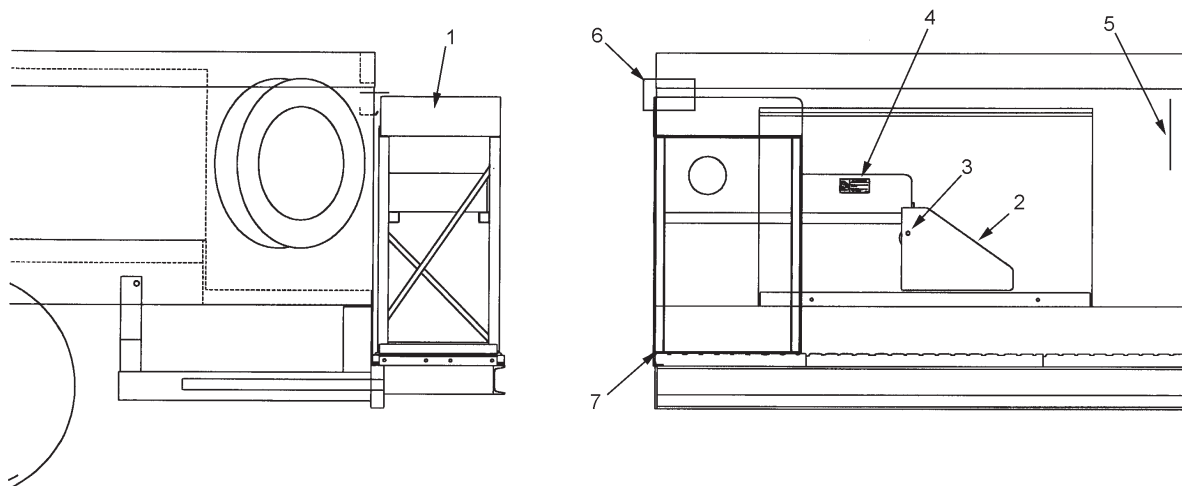


FIGURE 68.
STAIR, REAR, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
68-	305305		Stair, Rear, Option		Ref
1	305304		Stairs, Weldment, 402 Access		1
2	305301		Step Weldment, Flip, 402 Access		1
3	203199		Bolt, Shoulder, .625 x 1.75		2
4	305332		Decal, Warning, Rotating Parts		1
5	1.8789		Handle, Grab		1
6	302751		Bumper, Corner		2
7	305328		Angle, Mounting, Access Stair		1

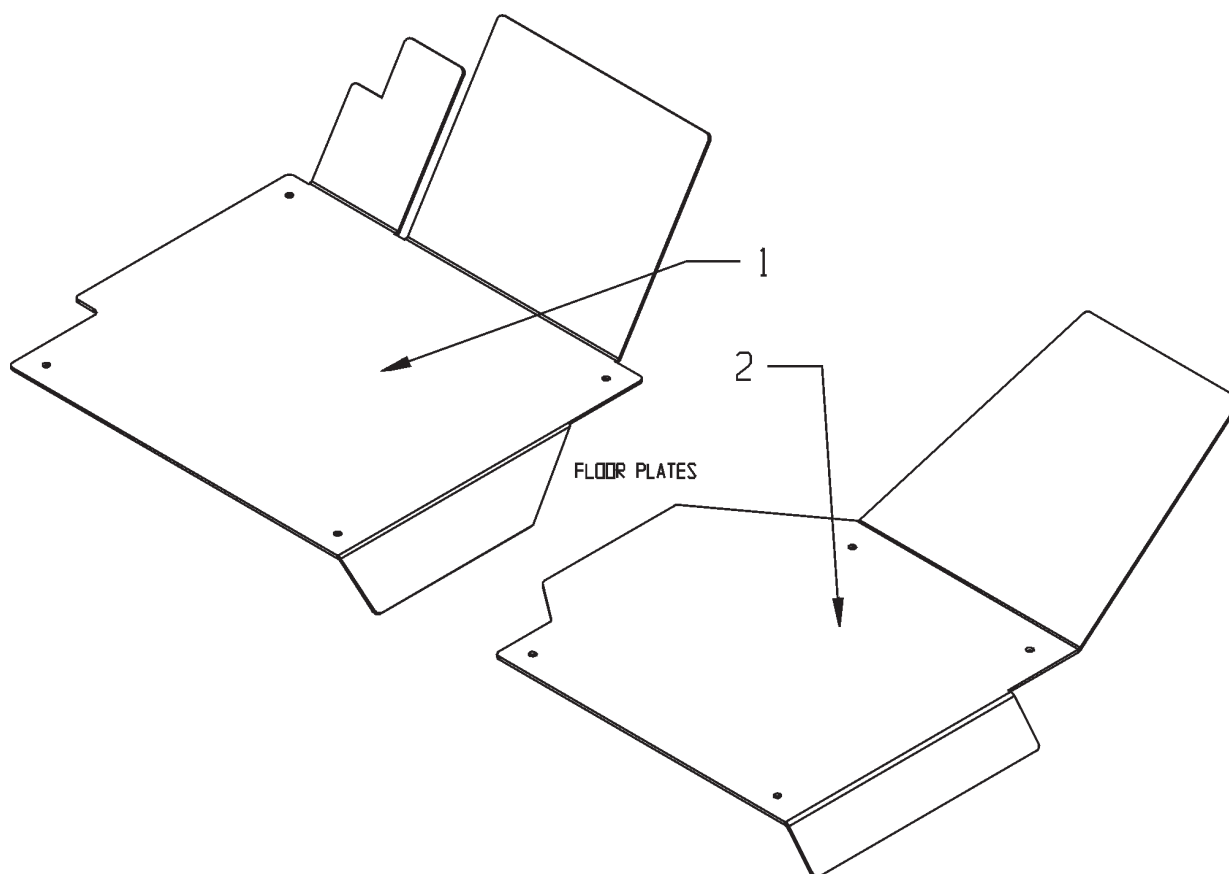


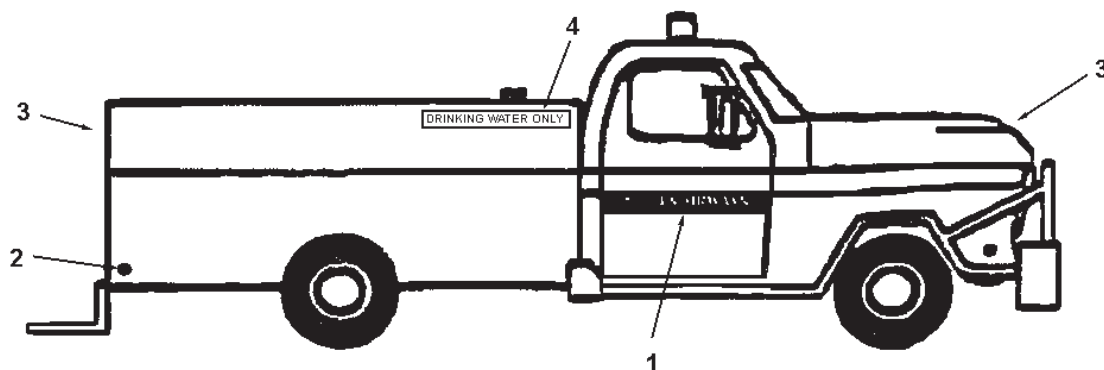
FIGURE 69.
CAB FLOOR PLATES, OPTION, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
69-	305365		Cab Floor Plates Option, 99 & Later	B	
1	305278		Plate, Floor, LH, F350		1
2	305277		Plate, Floor, RH, F350		1

U-S AIRWAYS

GROUND SUPPORT EQUIPMENT

Potable Water Truck



PAINT AND STRIPING INSTRUCTIONS

Paint Instructions: Paint vehicle and wheels US Airways Gray. Install the following decals as indicated in the table on the following page.

FIGURE 70.
DECALS, US AIR, OPTION

Fig.- Item	NMC Wollard Part No.	US Airways Part No.	Nomenclature	Instructions	Units Per Assy
70-	305380		Decals, US Air, Option		Ref
1		9200869	6" Wordmark	Install on door - Conform to body line as shown - Both ends. Continue stripe to end of cab (wrap around cab corners). NOTE: Keep decal overlap to 1/4 - 1/2 inch.	2
2		9201108	3" Reflector (Round) Silver	Install as shown on all 4 sides	8
3		BLUE Letters & Numbers	Cost Control Number	Install upper left corner (rear), front center on hood.	A/R
4		9203891	"Drinking Water Only" Decal	Install as shown - Both sides	2

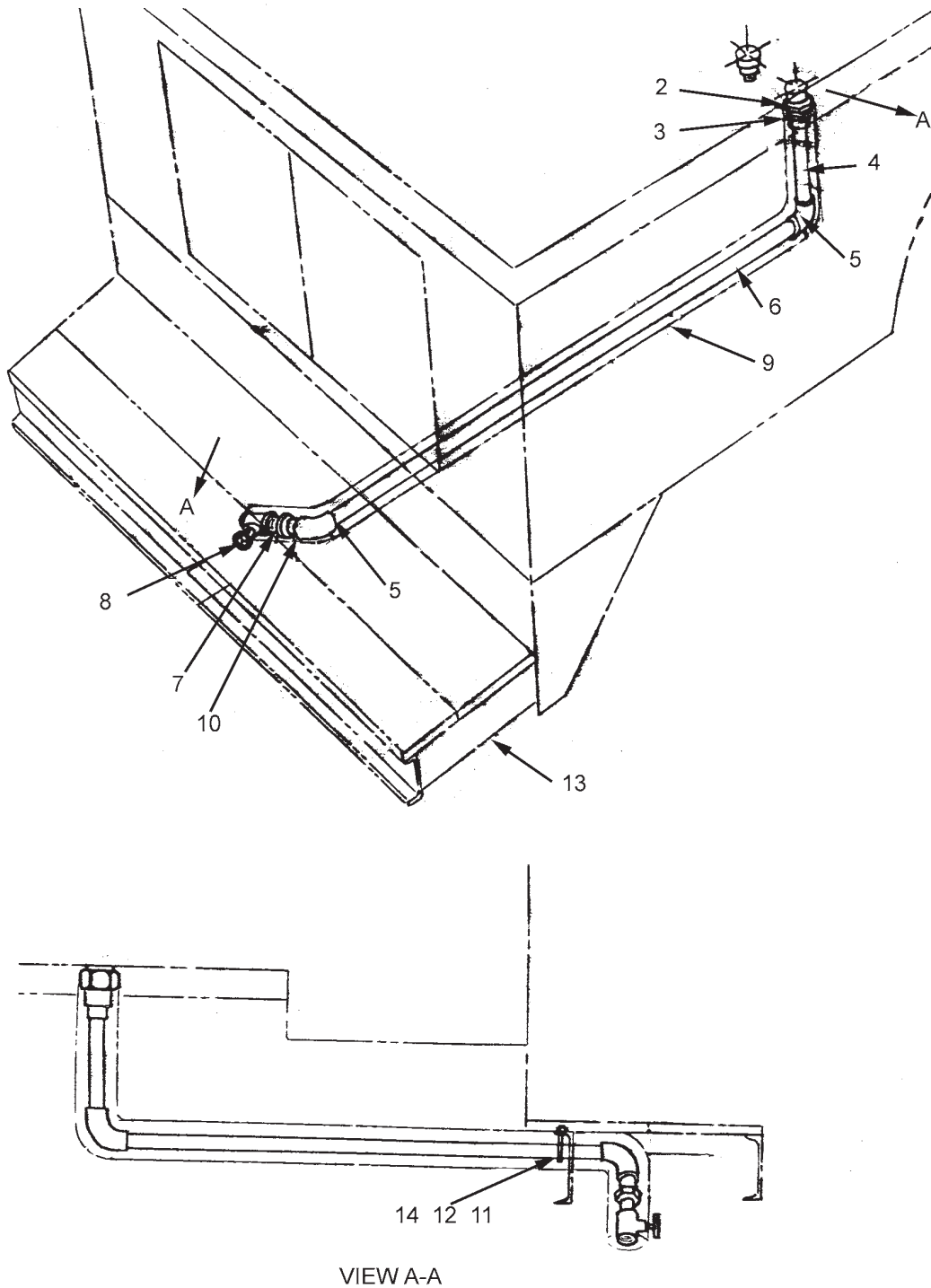


FIGURE 71.
DRAIN, REMOTE, OPTION, 1.5"

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
71-	17698		Drain, Remote, Option, 1.5"		Ref
2	1.8267		Adapter		1
3	1.8264		Bushing		1
4	9.1941		Pipe		1
5	1.8265		Elbow		2
6	9.1941		Pipe		1
7	1.8266		Adaptor		1
8	1.4435		Gate Valve		1
	309970		Valve, Ball, 1 1/4"	J	1
9	9.1940		Duct Insulation		6'
10	9.1941		Pipe		1
11	12654.32		Bolt, U		1
12	3.2764		Nut, Hx, Hd		2
13	13657		Rear Platform w/ Access Door Option		Ref
14	3.3125		Washer, Lock		2

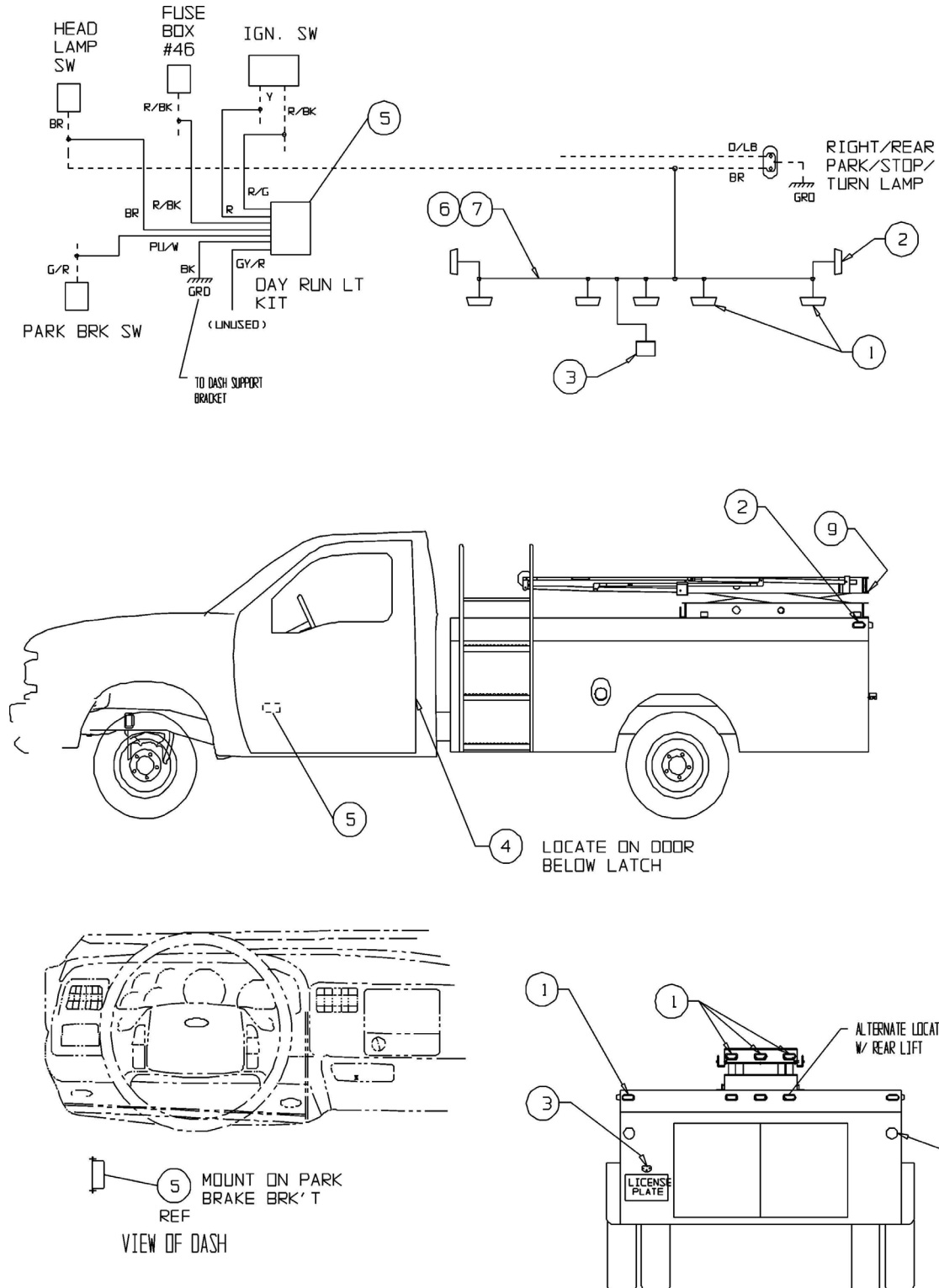


FIGURE 72.
LIGHTS, CANADA, TWS402, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
72-	304188		Lights, Canada, TWS 402 Option		Ref
1	2.3578		Light, Red 12V		5
2	2.3069		Light, Amber 12V		2
3	301662		Light, Auxiliary 12V		1
4	304191		Placard, Canada, Vehicle Altered		1
5	304989		Kit, Daytime Run Lights		1
6	2.2612		Wire, Black, 16 Ga		720"
7	2.3478		Conduit, 1/4" Flexguard		600
8	1.7779		Reflector Red 3"		2
9	304426		Bracket Light Mounting Lift		1

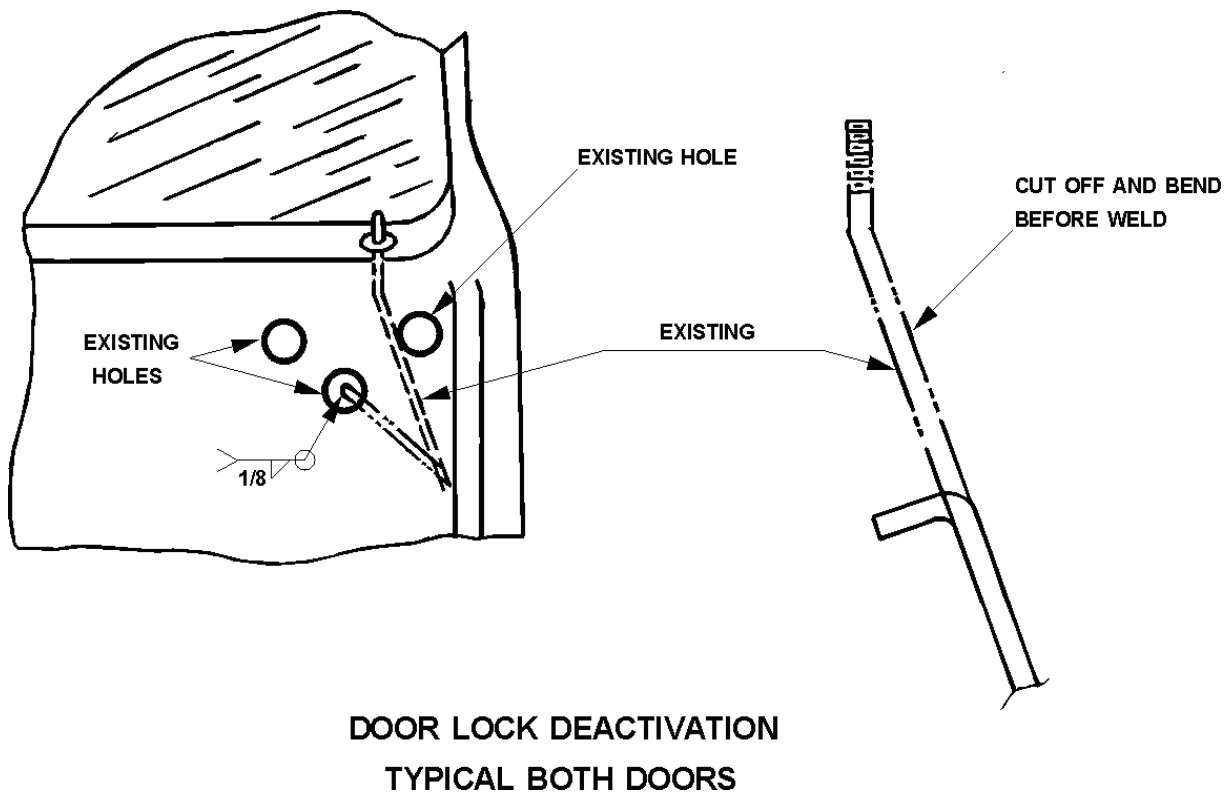


FIGURE 73.
DOOR LOCK DEACTIVATION OPTION, 96/97

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
73-	8928		Door Lock Deactivation Option, 96/97	A	Ref

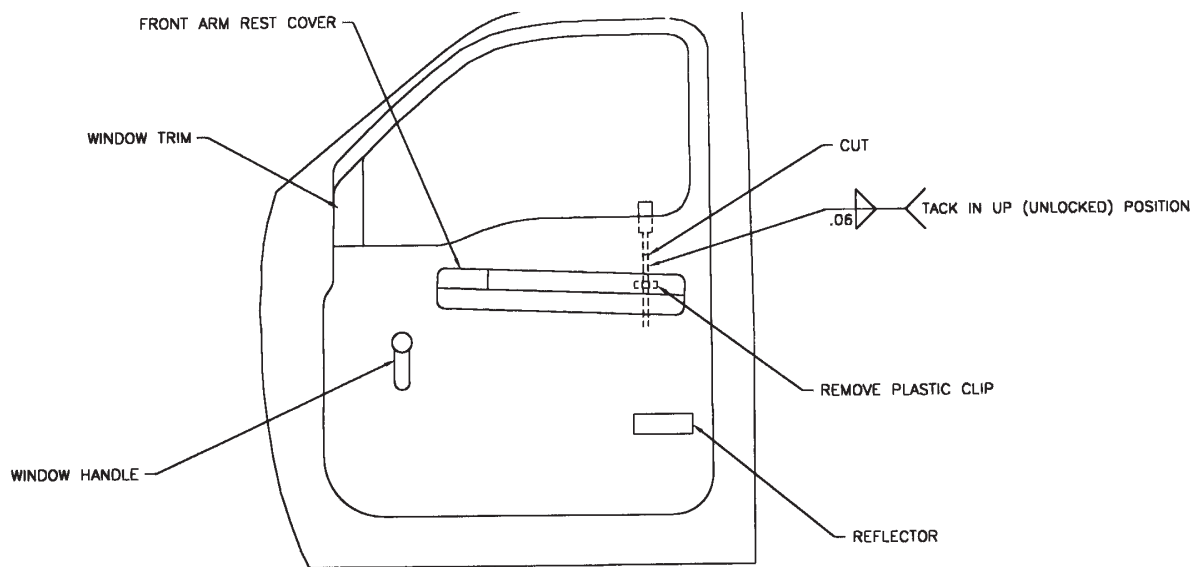


FIGURE 74.
DOOR LOCK DEACTIVATION OPTION, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
74-	8928		Door Lock Deactivation Option, 99 & Later	B	Ref

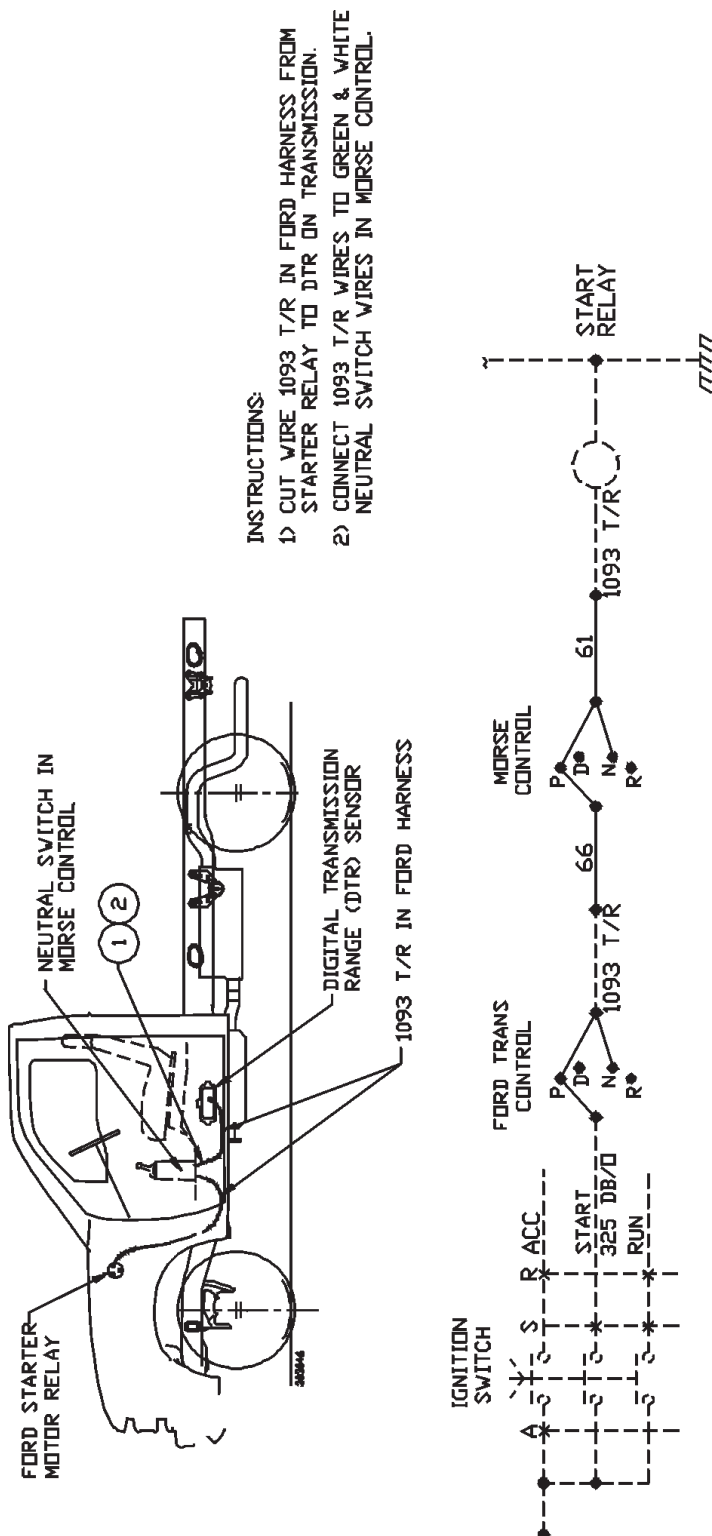


FIGURE 75.
NEUTRAL INTERLOCK, 2ND, F350/F450, GAS/DIESEL, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
75-	303046		Neutral Interlock, 2nd, F350/F450, Gas/Diesel, 99 & Later	B	Ref
1	2.2612		Wire (Bk) 16 Ga, SAE J1128 Gpt		48
2	2.3478		Conduit, Flex		36

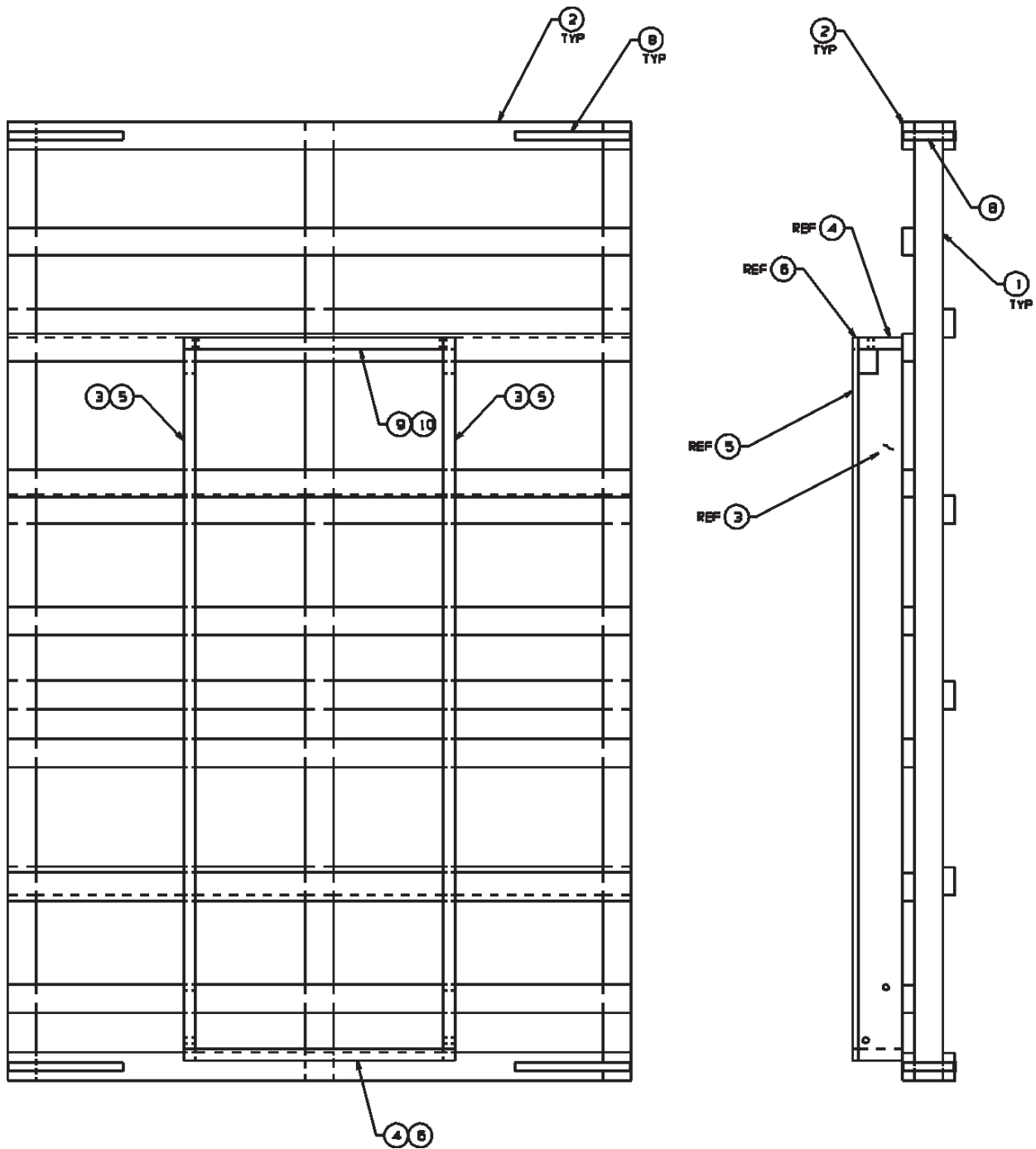


FIGURE 76.
SKID KIT, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
76-	19535MB		Skid Kit Option		Ref
1	RF090877		Lumber - 4" x 4" x 120" Lg		3
2	RF090879		Lumber - 2" x 4" x 78" Lg		15
3	RF090894		Lumber - 2" x 6" x 89.0" Lg		2
4	RF090894		Lumber - 2" x 6" x 31" Lg		1
5	RF090895		Lumber - 1" x 2" x 89.0" Lg		2
6	RF090895		Lumber - 1" x 2" x 34" Lg		1
7			Nails, Sinker, 160 x 3-1/4" Lg		A/R
	306344		Nails, 16 Penny, 1 Lb. Box		2
8			Banding Strip, 1" Wd x 36" Lg		4
9	RF090894		Lumber - 2" x 6" x 34" Lg		1
10	RF090895		Lumber - 1" x 2" x 31" Lg		1
NS	306344		Nails, 16 Penny		2#

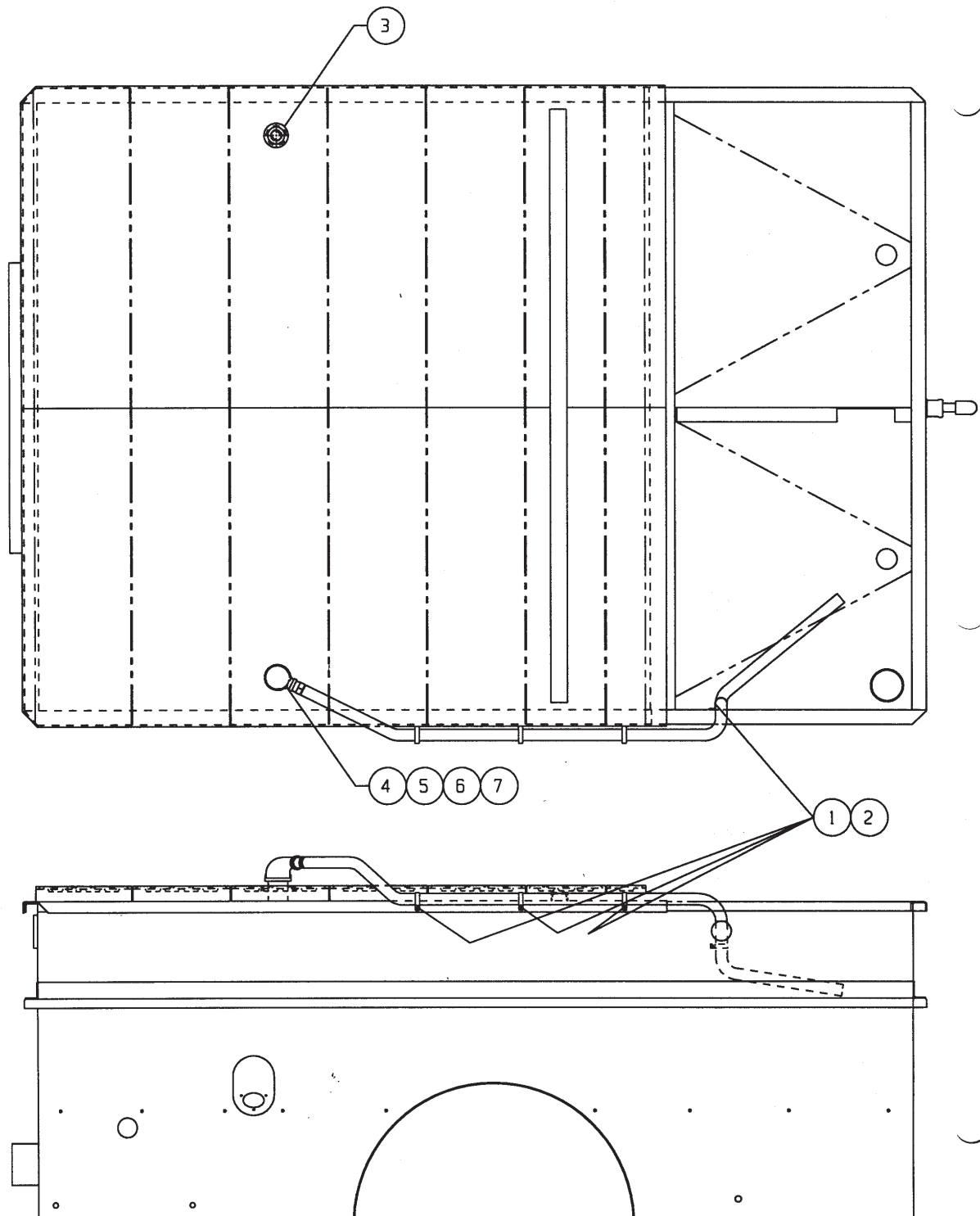


FIGURE 77.
TANK, VENT/FILL COUPLING, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
77-			Tank, Vent/Fill Coupling, Option		Ref
1	302140		Clamp, Loop Type, 1-1/2		4
2	Comm		Screw Self Taping		4
3	306885		Cap Assembly, 2" Fill Non-Vented		1
	306864		Kit Water Truck Venting		1
4	305270		Fitting, P, Ell, 32FP-16FP90 Galvanized		1
5	3.0642		Fitting, Hydraulic, 16MP-16H, Brass		1
6	9.1841		Hose Food Grade 1.00 x 1.375		84"
7	3.1086		Clamp, Hose, S/S, 13/16" 1-1/2		1
NS			Grommet, 1.5ID, 2.0OD 3/32 Grv		1

For reference only---this option no longer available

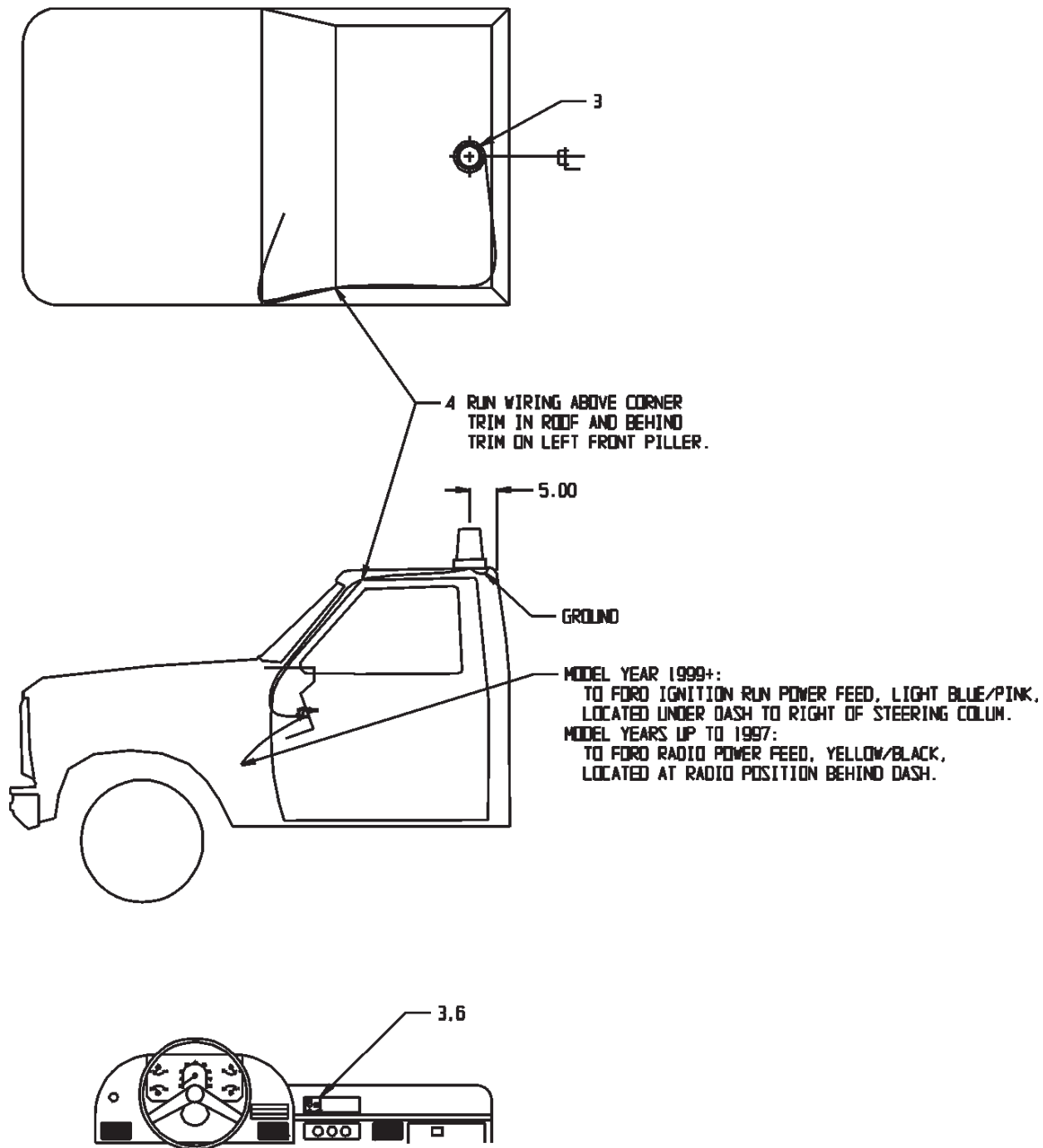


FIGURE 78.
CAB ROTATING BEACON, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
78-	306992		Cab Rotating Beacon, Option		Ref
2	306993		Beacon, Rotating, Amber		1
3	2.1031		Switch, Toggle, Spnd		1
4	2.1532		Wire, 14AWG Type GPT Black		192"
6	562A518		Placard, Beacon		1

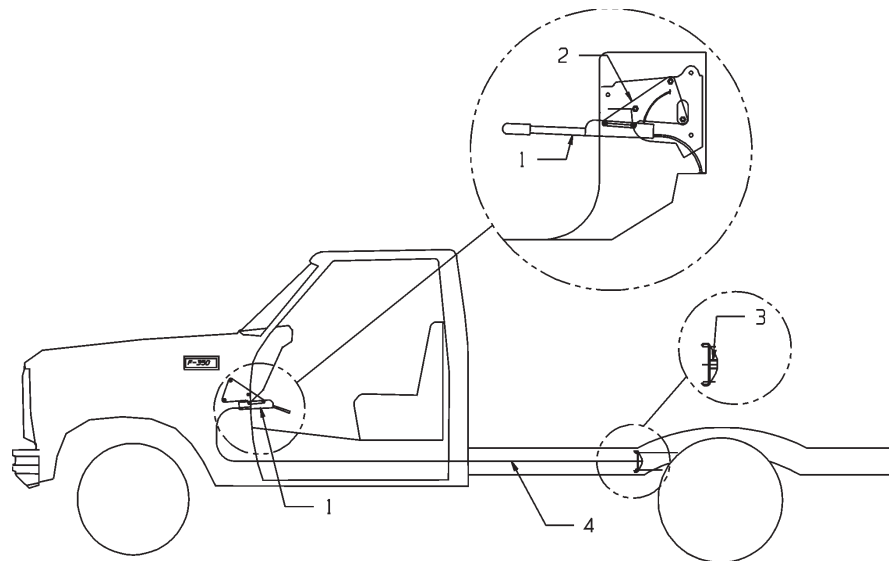


FIGURE 79.
PARKING BRAKE, OPTION

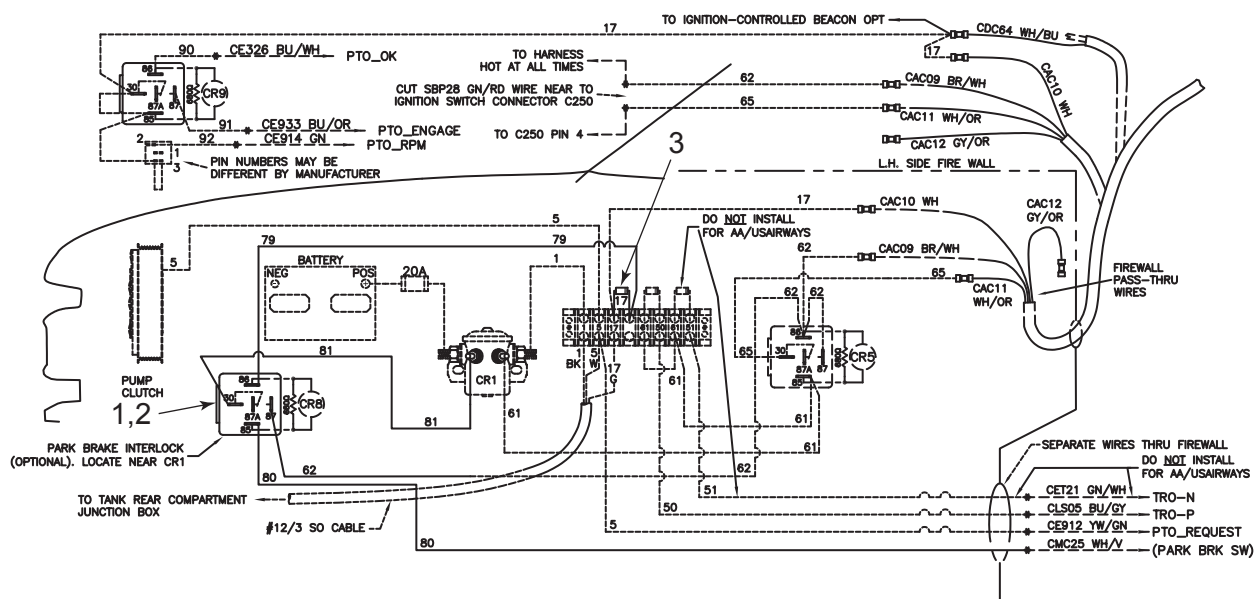


FIGURE 80.
PARKING BRAKE INTERLOCK, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
79-	303809		Parking Brake, Option		Ref
1	303988		Parking Brake Kit		1
2	303894		Plate, Parking Brake Mtg		1
3	303916		Plate, Equalizer Mod.		2
4	303915		Cable, Parking Brake		1

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
80-	309956		Parking Brake Interlock, Option		Ref
1	309961		Relay, 12V, SPDT, 40A		1
2	37048		Socket, Relay, 5-Pos.		1
3	2.3093		Diode, 3A, 200V, Axial		1

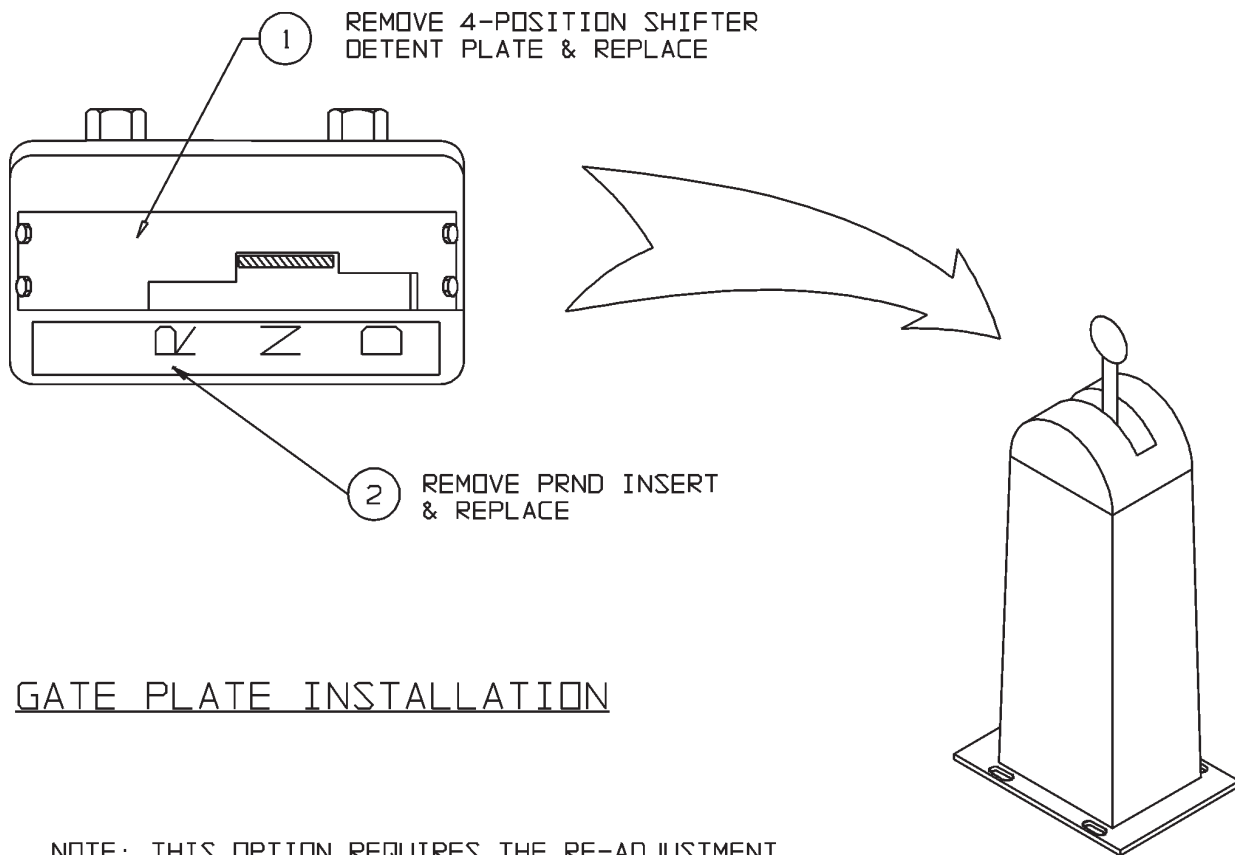


FIGURE 81.
GATE PLATE, OPT, DNR F350, 99 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
81-	306303		Gate Plate, Opt, DNR F350, 99 And Later		Ref
1	306287		Plate, Shift Gate, 3-Pos		1
2	306295		Insert, Legend, DNR		1

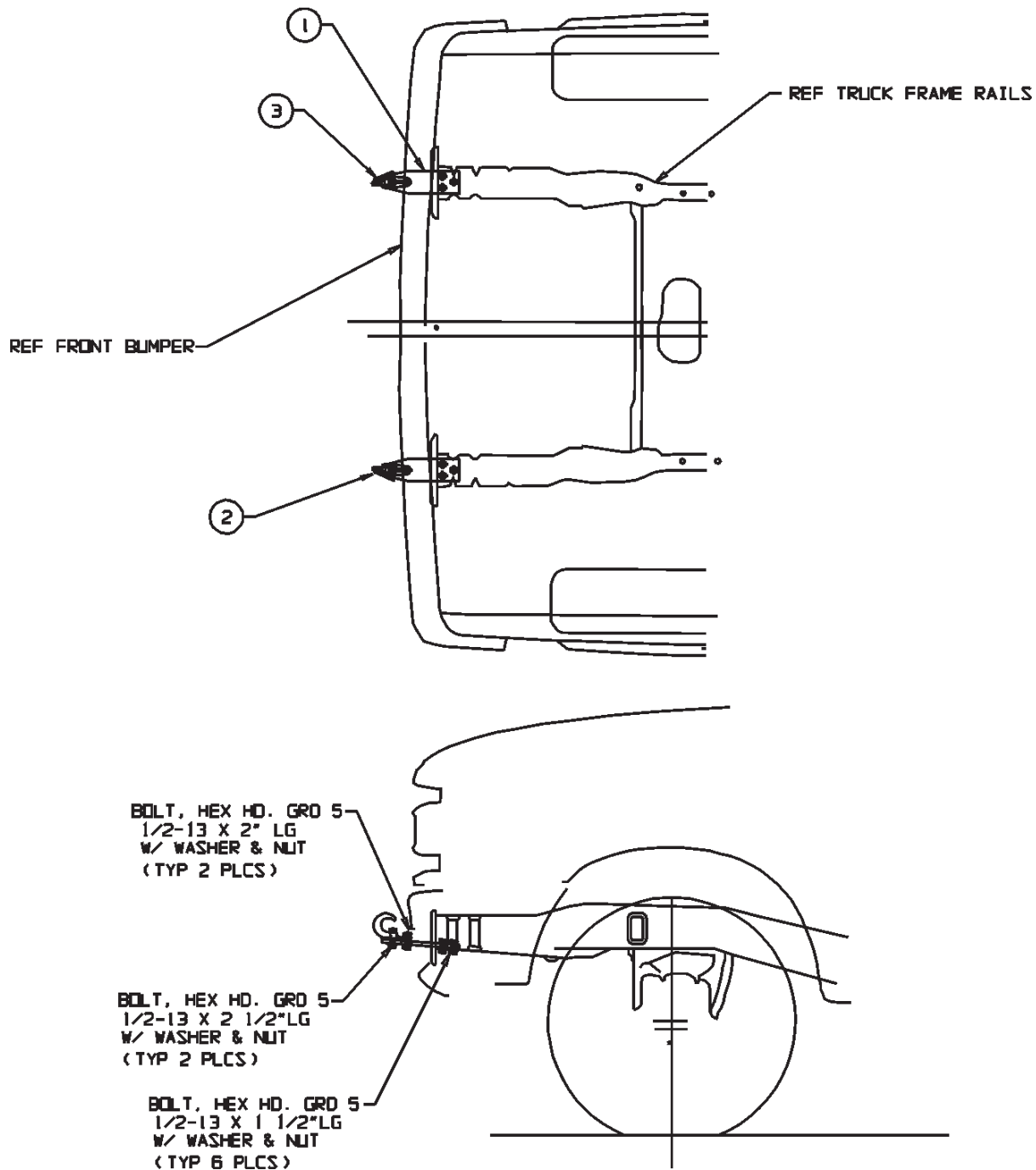


FIGURE 82.
TOW HOOKS, FRONT, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
82-	303794		Tow Hooks, Front, Option		Ref
1	303795		Plate, Tow Hook Mtg		2
2	1.8674		Tow Hook		1
3	1.8672		Tow Hook		1

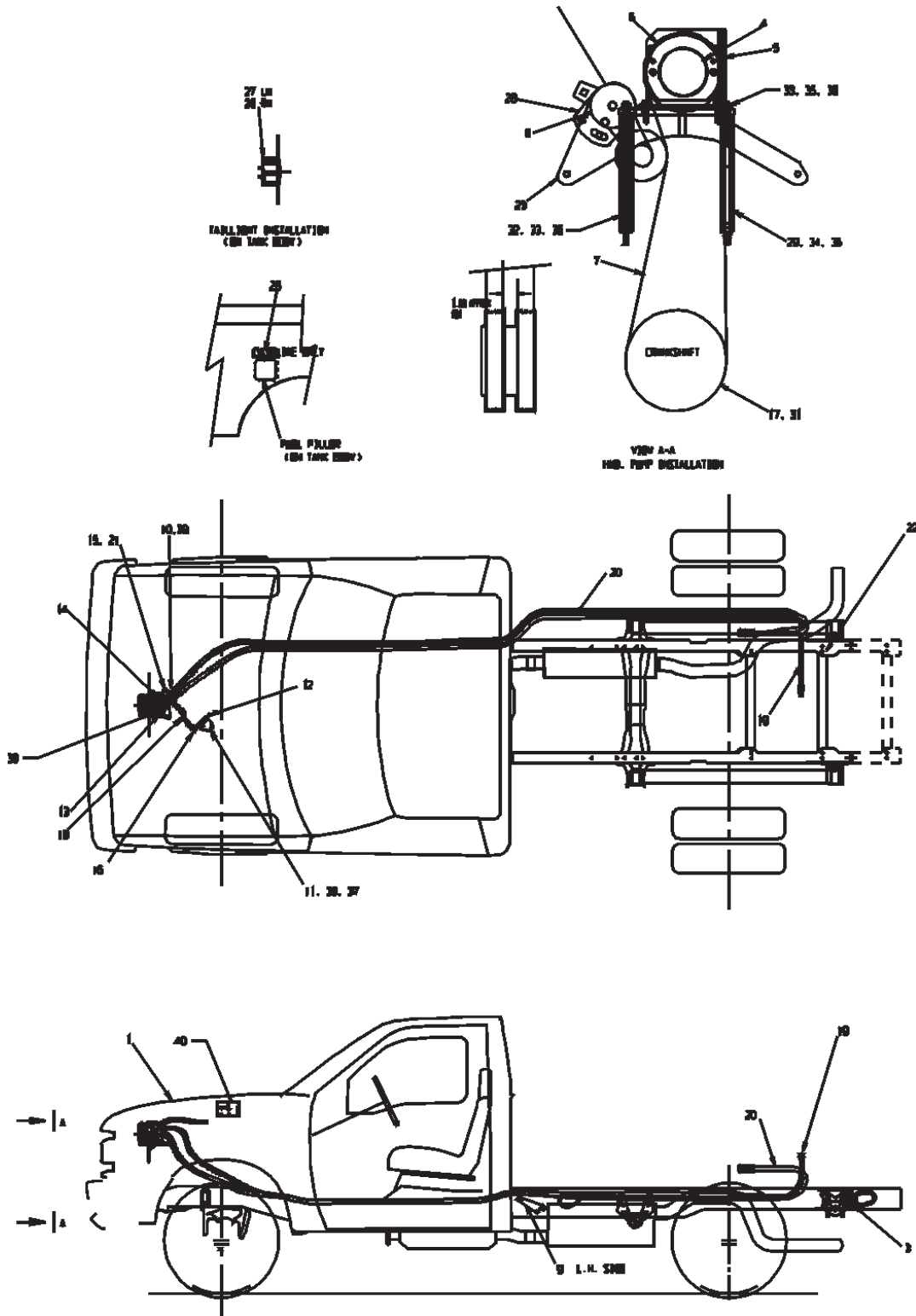
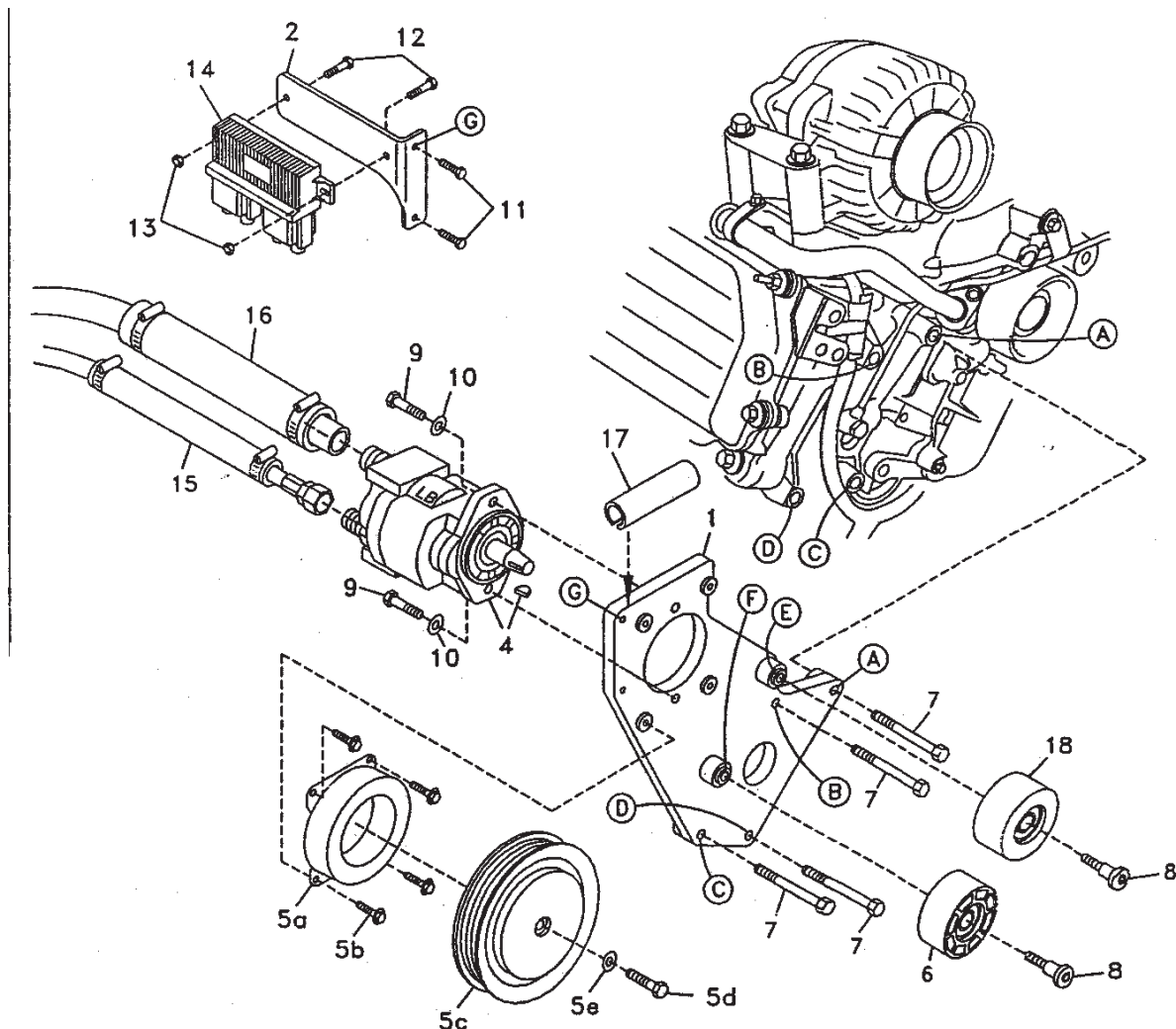


FIGURE 83.
TRUCK CHASSIS, F350, V10 GAS - 02 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
83-	307127		Truck Chassis, F350, V10 Gas - 02 and Later		Ref
3	303920		Plate, Rear Frame Mnt		2
4	301556		Pump, Hyd, Rear Ports, 0.77 CIR		1
5	303724		Brkt Wldmnt, Pump Mtg		1
6	303722		Clutch, Mag, 8-Groove		1
7	306373		Belt, 8-Groove, 60", 770/402, V8		1
8	306644		Tensioner, Belt, Mod (306372)		1
9	303918		Nut-Plate Wldmnt, F Frame		1
10	18404		Cyl, 0.5638 x 1S x .25R, Sprg Rt		1
11	307124		Mnt, Throttle Adv Cyl, 02 F350		1
12	3.3051		Nut, Coupling, 1/4-28, 3/8/x 7/8		1
13	200304		Ftg, Hyd, 16MJ-12MB45		1
14	202074		Ftg, Hyd, 08MJ-10MB45		1
15	3.2679		Ftg, Hyd, Tee, 08MJ-08FJX-08MJ		1
16	3.2326		Ftg, Hyd, 06MJ-02MP		1
17	307150		Pulley, 8-Groove, 60", 770/402, V8		1
18	8945.21		Hose Assy, #6M, 32.64", ST/ST		1
19			Hose Assy, #8 ST/ST		1
20			Hose Assy, #16 ST/ST		1
21	3.2884		Ftg, Hyd, 08FJ-06MJ		1
22	303769		HHCS 3/8-16 x 1.5, GR8		1
23	306374		Brkt Wldmnt, Pump, 770/402, V8		1
25	562A279		Decal, Gasoline Only		1
26	303742		Brkt, Taillight, RH		1
27	303773		Brkt, Taillight, LH		1
28	306377		Plate, Tensioner, Hyd Pump Brkt		1
29	307131		Standoff, Hyd Pump, 02 F350 V8		1
30	301294.2		Spacer, F300, .7500 x .38 ID x 44		1
31	306409		HHCS M10 x 1.5 x 25MM		3
32	419401		Cut, 4194, 10.00		1
33	F103925		Nut Hex M10 x 1.5P GR 8.8 ZP		6
34	3.3189		HHCS M10 x 1.5 x 25MM		1
35	419402		Cut, 4194, 3.00		1
36	3.3326		LW M10		4
37	306519		HHCS M6 x 1.0 x 25		1
38	307120		Plate, Alt Stab, 02 F350		1
39	307123		Linkage, Throttle Adv, 02 F350		1
40	307125		Plate, Relay Mnt, 02 F350		



(A),(B),(C)... Denotes bolt holes in engine to locate corresponding holes in Pump Brkt.

FIGURE 84.
FORD 6.0L DIESEL CLUTCH PUMP KIT

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
84-	307294		Ford 6.0L Diesel Clutch Pump Kit		Ref
1	307278-1	711466	Pump Mount Bracket		1
2	307278-2	711468	Electrical Module Bracket		1
3	307278-3	700255	Intercooler Tube		1
4	307278-4	720172	Pump		1
5	307278-5	740148	Clutch		1
6	307278-6	740261	Idler Pulley		1
7	F101360	110488	M10 x 45 x 1.5 Bolt		1
8	307278-8	110213	M10 x 40 Torx Head Shoulder Bolt		1
9	F100312	110425	3/8-16 x 1 1/4 Bolt		1
10	F100062	110676	3/8 Flat Washer		1
11	F100304	110561	1/4-20 x 3/4 Bolt		1
12	F017264	110464	1/4-20 x 1 Bolt		1
13	F009536	110609	1/4-20 Nut		1
14	307278-14	OEM	Electrical Module		1
15	307278-15		Insulation, For 1 1/2" Pressure Hose		1
16	307278-16		Insulation, For 2" Suction Hose		1
17	307278-17	700261	Hose, Intercooler Tube Rest		1
18	307055	740242	Idler Pulley		1
19	307056	740360	Belt, Poly-Cog 1490K8		1

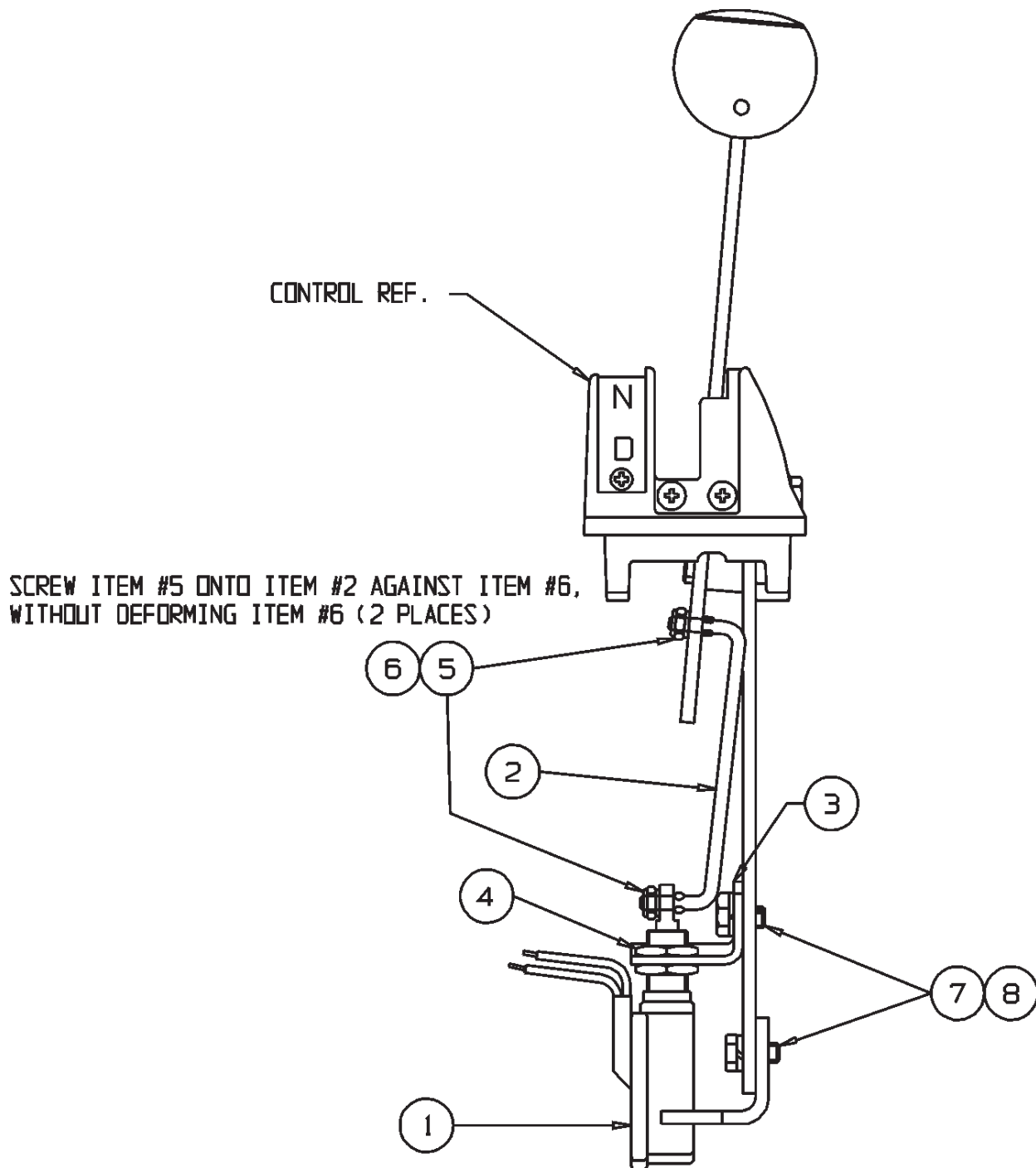


FIGURE 85.
PUMP IN PARK ONLY, OPTION KIT

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
85-	306837		Pump In Park Only, Option Kit		Ref
1	2.1898	045184	Switch (41625)		1
2	306834	048353	Arm, Switch (41625)		1
3	306835	043684	Bracket, Switch (41625)		1
4	3.1663		Nut, Hex Extra-Thin		2
5	306839		Nut, Hex Jam, Nylock, #10-32		2
6	306838		O-Ring, Buna-N, 3/16 ID x 5/16 OD x 1/16W		2
7	306840		Bolt, Hex Head, 1/4-28 x 0.5" Lg		2
8	F009535		Washer, Lock, Split, 1/4"		2

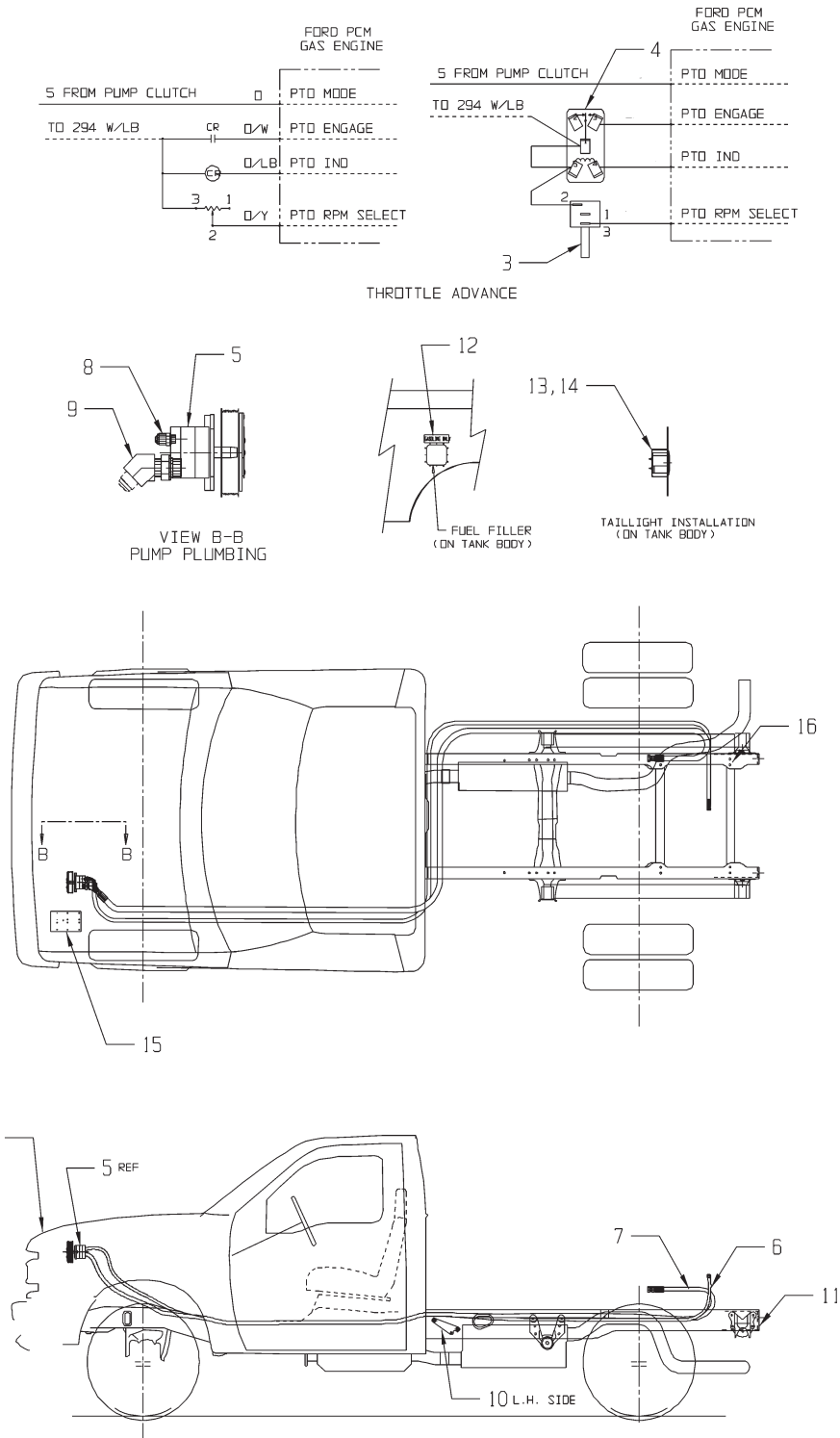
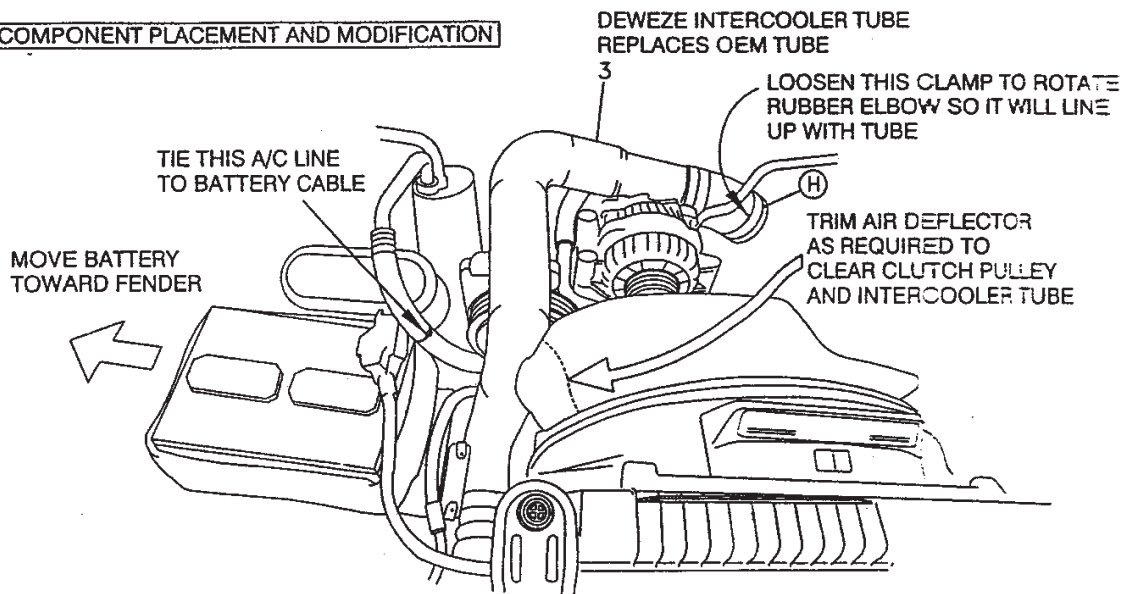


FIGURE 86.
TRUCK PREP, F350, V8 GAS, 2005 & LATER
1 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
86	307393		Truck Prep, F350, V8 Gas, 2005 & Later (1 Of 2)	F	Ref
	309144		Truck Prep, F350, V8 Gas, 2009		Ref
	309628		Truck Prep, F350, V8 Gas, 2011		Ref
	309995		Truck Prep, F350 V8 Gas, 2014	J	Ref
1			Truck Chassis, F350, V8 Gas		Ref
3	307528		Potentiometer, 5K OHM, 3W, 10 Turn		1
4	2.3648		Relay, SPDT, 15A (Use SB502 for repairs)		1
5	307498		Pump Kit w/ Clutch F350 V8, Gas, 05		1
	309061		Pump Kit w/ Clutch F350 V8, Gas, 09		1
	309516		Pump Kit w/ Clutch F350 V8, Gas, 11		1
	309993		Pump Kit w/ Clutch F350 V8, Gas, 14	J	1
6	8797.92		Hose Assy, 08 x 248" ST/90		1
7	10384.49		Hose Assy, 16 x 251.5" ST/ST		1
8	3.2961		Ftg, Hyd, 08MJ-12MB		1
9	NW035809		Ftg, Hyd, 16MJ-16MB45		1
10	303918		Nut-Plate Wldmnt, LH Front Mtg		1
11	303920		Plate, Rear Frame Mtg		2
12	562A279		Decal, Gasoline Only		1
13	303742		Bracket, Taillight, RH		1
14	303773		Bracket, Taillight, LH		1
15	307125		Plate, Relay Mtg		1
16	303769		HHCS 3/8-16 x 1.5 Gr8 w/ Nut		8
NS	301236		Manual, TWS402 (Install Per 305717)		Ref
NS	303547		Out Svce, Alignment		1

COMPONENT PLACEMENT AND MODIFICATION



BELT DIAGRAM

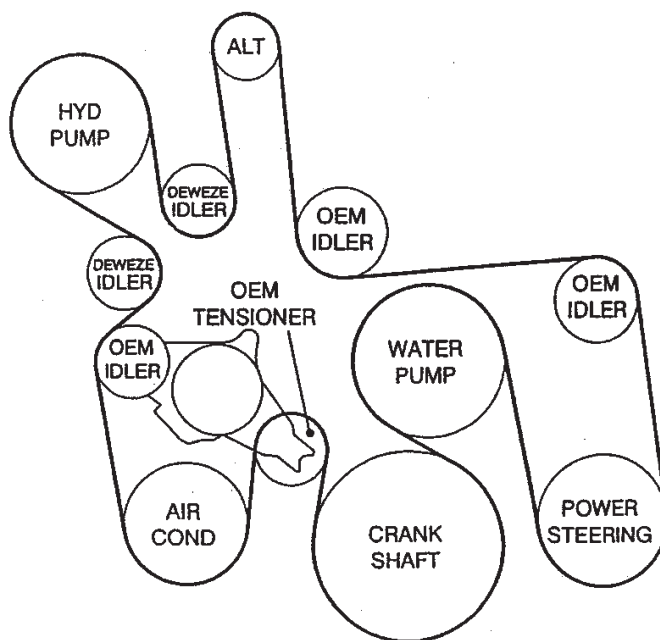


FIGURE 86.
TRUCK PREP, F350, V8 GAS, 2005 & LATER
2 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
86	307393		Truck Prep, F350, V8 Gas, 2005 & Later (2 Of 2)	F	Ref
1		711625	Engine Bracket		1
2		740383	Crankshaft Pulley		1
3		711630	Idler Bushing		2
4		740145	Idler Pulley, Flat 3.75"		1
5		740302	Idler Pulley, Flat 3.00"		1
6		740385	Tensioner		1
7			Pump, a Rear Port		1
8		742016	Clutch		1
9		110761	M10 x 1.5 x 110 Bolt		4
10		110180	M10 x 1.5 x 60 Bolt		5
11	F100312	110425	3/8-16 x 1 1/4 Bolt		2
12		110747	M12 x 1.75 x 75 Bolt		1
13			Bolt		1
14		110689	M10 Lock Washer		3
15	F100062	110676	3/8 Flat Washer		7
16		740233	Idler Pulley, 6-Groove		1
17		110469	M8 x 1.25 x 20 Bolt		1
18		110703	M8 Flat Washer		1
19		742019	Belt, Micro-V K060725		1

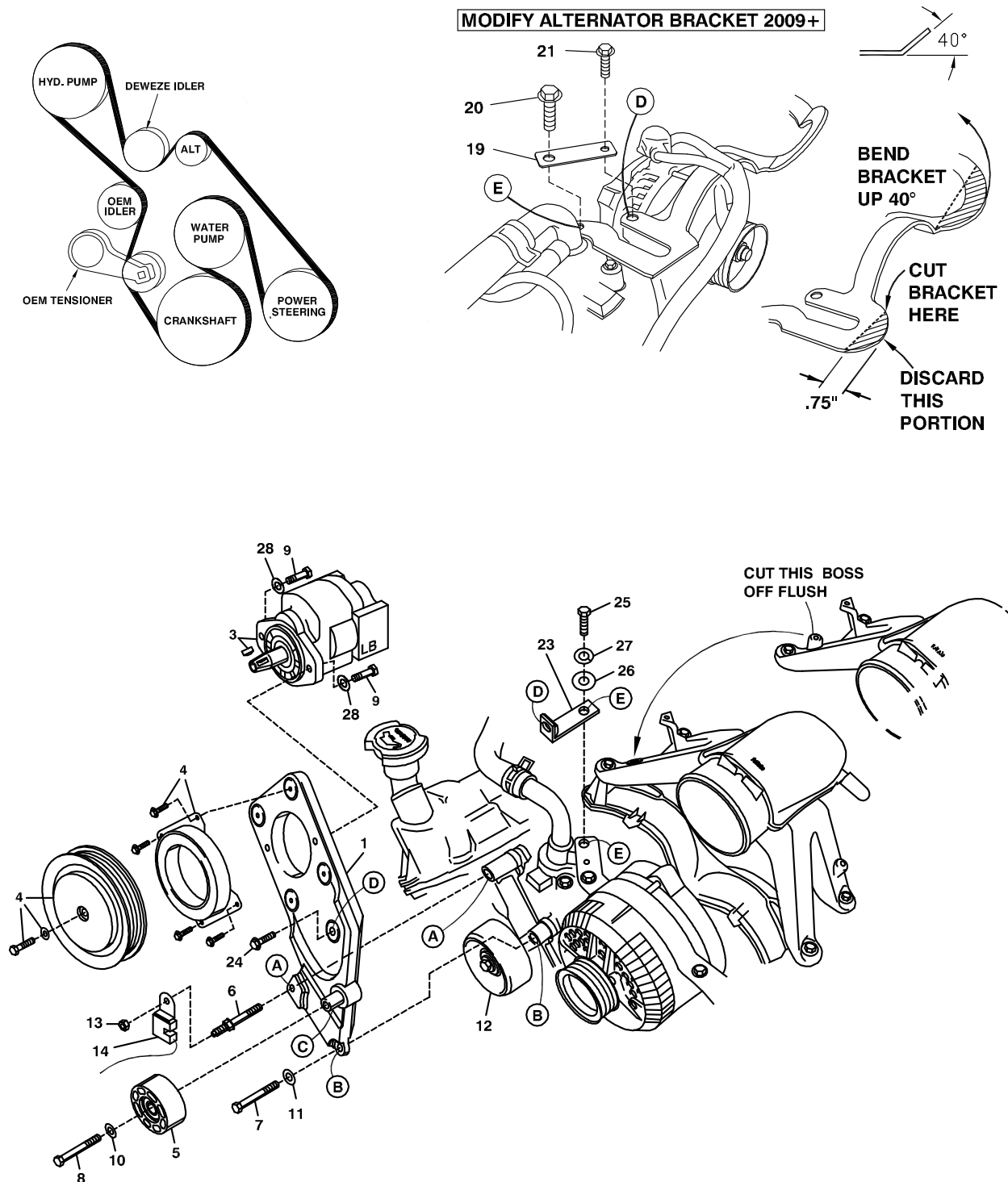


FIGURE 87.
PUMP KIT W/CLUTCH, F350, GAS, 2009

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
87	309061		Pump Kit, F350 Gas, 2009		Ref
1		716066	Engine Bracket		1
3			Pump		1
4		742016	Clutch		1
5		740151	Idler Pulley		1
7			Pump, a Rear Port		1
8		742016	Clutch		1
12			OEM Idler Pulley		1
15		110676	Belt, Micro-V K061105		1

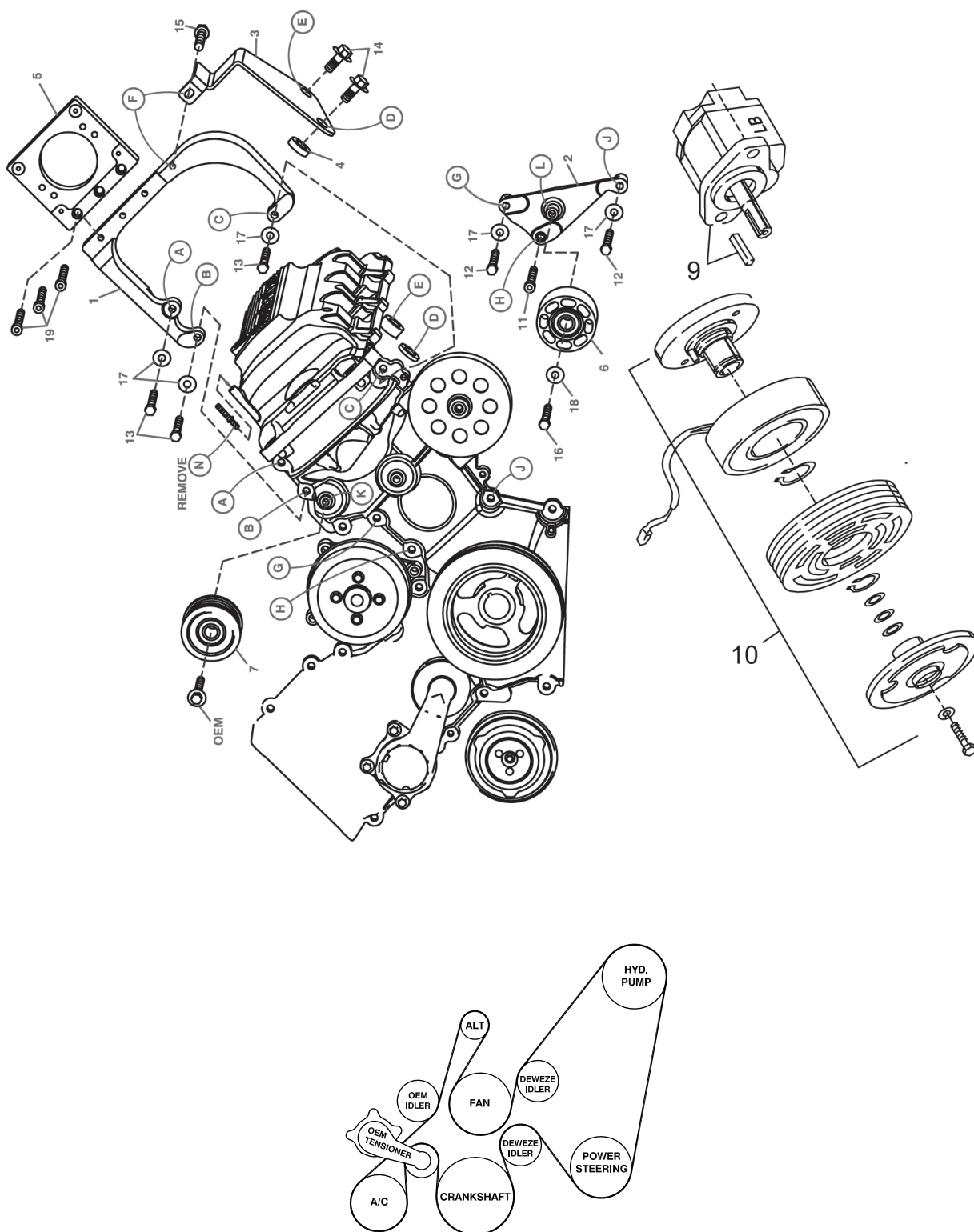


FIGURE 88.
PUMP KIT W/CLUTCH ,F350, GAS, 2011

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
88-	309516		Pump Kit w/Clutch F350 V8, Gas, 2011		
1		716047	Pump Bracket		1
2		716048	Idler Brkt		1
3		716049	Brace, Pump Mount		1
4		716050	Bushing, Brace		1
5		710936	Pump Plate		1
6		740151	Idler, Flat		1
7		740427	Idler, 6 Groove		1
9			Pump		1
10		742016	Clutch, 6 Groove W/Diode		1
15		740283	Belt		1

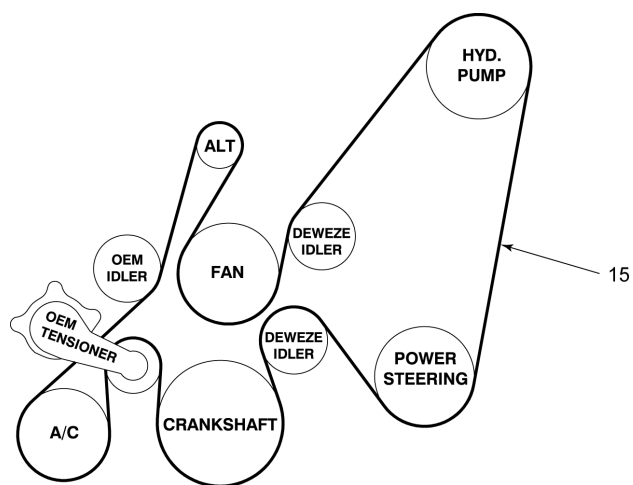
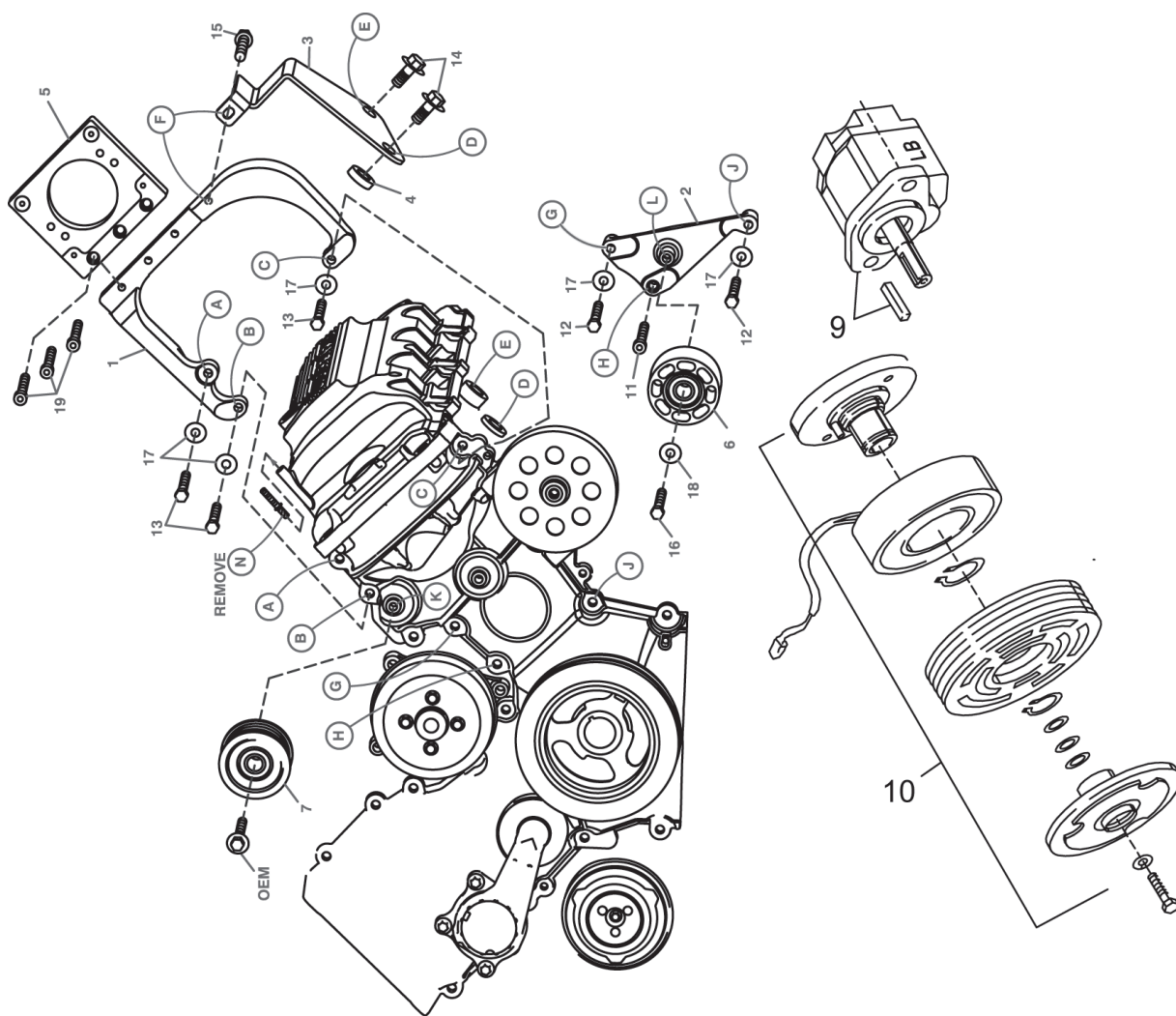
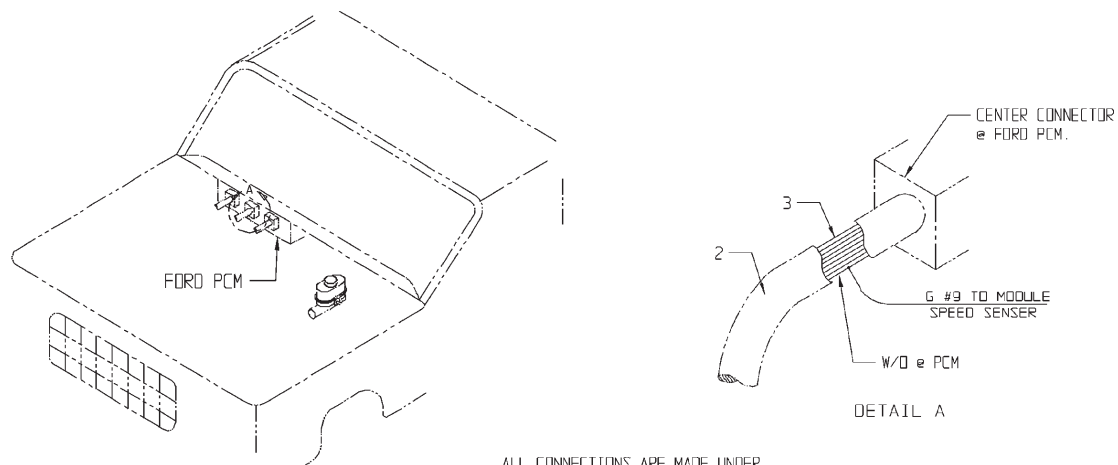
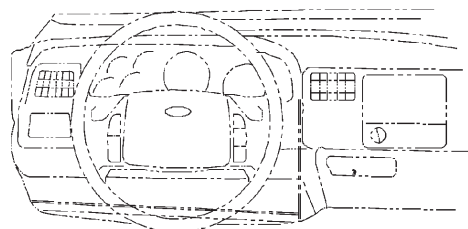


FIGURE 89.
PUMP KIT W/ CLUTCH, F350, V8 GAS 2014+

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
89-	309993		Pump Kit w/Clutch F350 V8, Gas, 2014+	J	
1		716047	Pump Bracket		1
2		716048	Idler Brkt		1
3		716049	Brace, Pump Mount		1
4		716050	Bushing, Brace		1
5		710936	Pump Plate		1
6		740151	Idler, Flat		1
7		740427	Idler, 6 Groove		1
9			Pump		1
10		742016	Clutch, 6 Groove W/Diode		1
15		740283	Belt		1
NS		702143	Resonator		1
NS		702144	Bracket, Alt/Res		1



ALL CONNECTIONS ARE MADE UNDER
DASH NEAR STEERING COLUMN EXCEPT
FOR GREEN #9 GOING TO FORD PCM



MOUNT ITEM #1 BELOW
DASH ON FIREWALL.

VIEW OF DASH

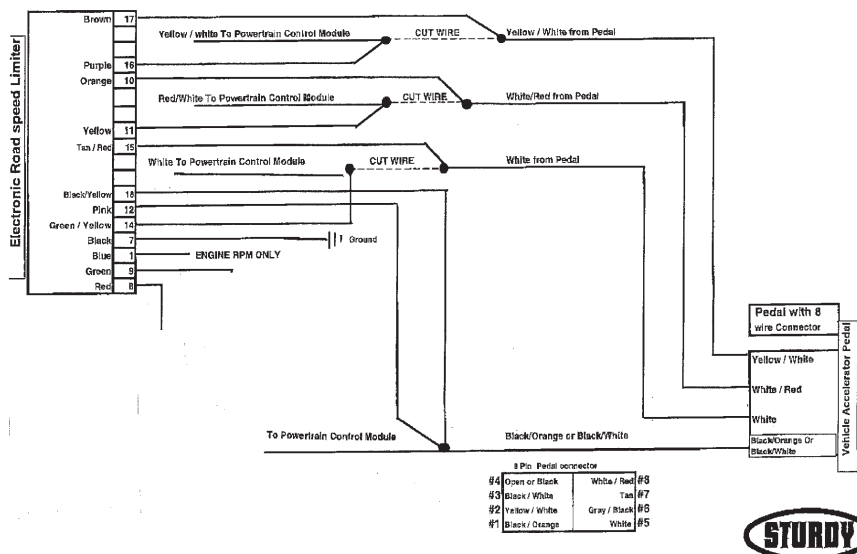
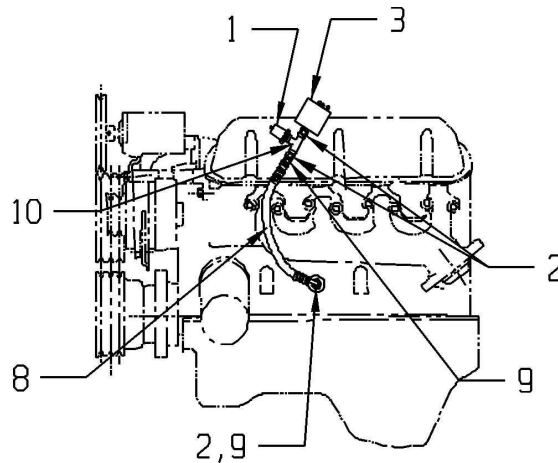


FIGURE 90.
GOVERNOR, F350 GAS, 2005 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
90-	307521		Govenor, F350 Gas, 2005 & Later		Ref
1	307522		Module, Govenor		1
2	2.3478		Loom, 1/4 ID, Flexguard		72"
3	2.1532		Wire, 14Ga, Bk		84"



FUSE PANEL UNDER DASH

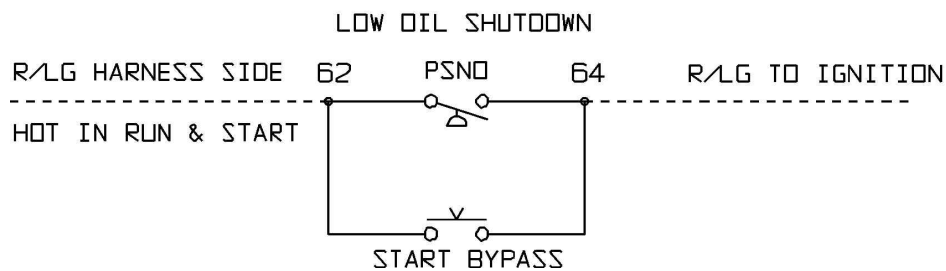
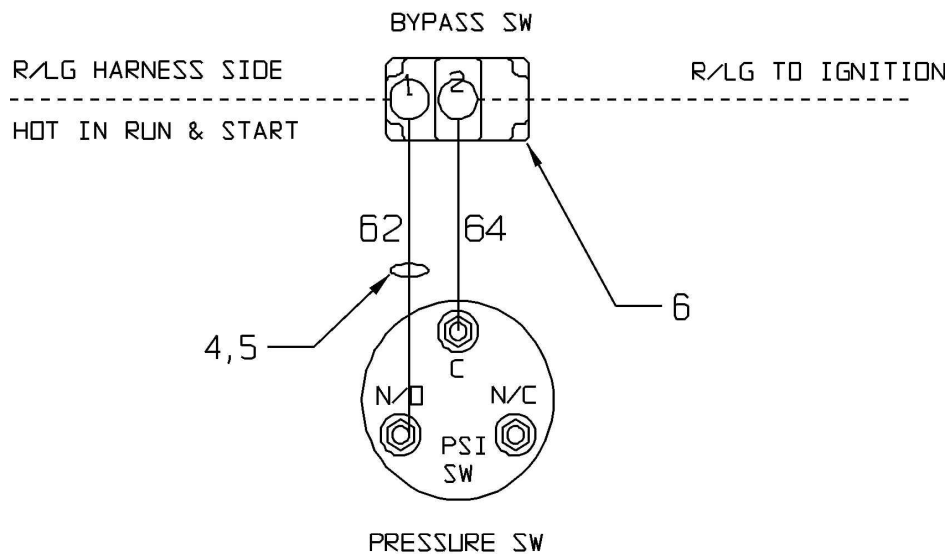


FIGURE 91.
LOW OIL SHUTDOWN, GAS/DSL

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
91-	307538		Shut Down, Low Oil, TMPS200 Gas/ Dsl, Option		Ref
1			Ford Pressure Switch		Ref
2	3.2283		Ftg, Hyd, 04MP-02FP		3
3	2.3707		Pressure Switch, SP2C-8F-8PSI		1
4	2.2612		Wire, Bk, 16Ga		240"
5	2.3478		Conduit, Flexgaurd, 1/4"		120"
6	2.3550		Switch		1
7	562A347		Placard, Low Oil Bypass (Not Shown)		1
8	14762.8		Hose Assy, #04M, 26" LG, ST/90		1
9	3.1352		Ftg, Hyd, 04MJ-02MP		2
10	3.0802		Ftg, Hyd, Tee, 04MP-04MP-04MP		1

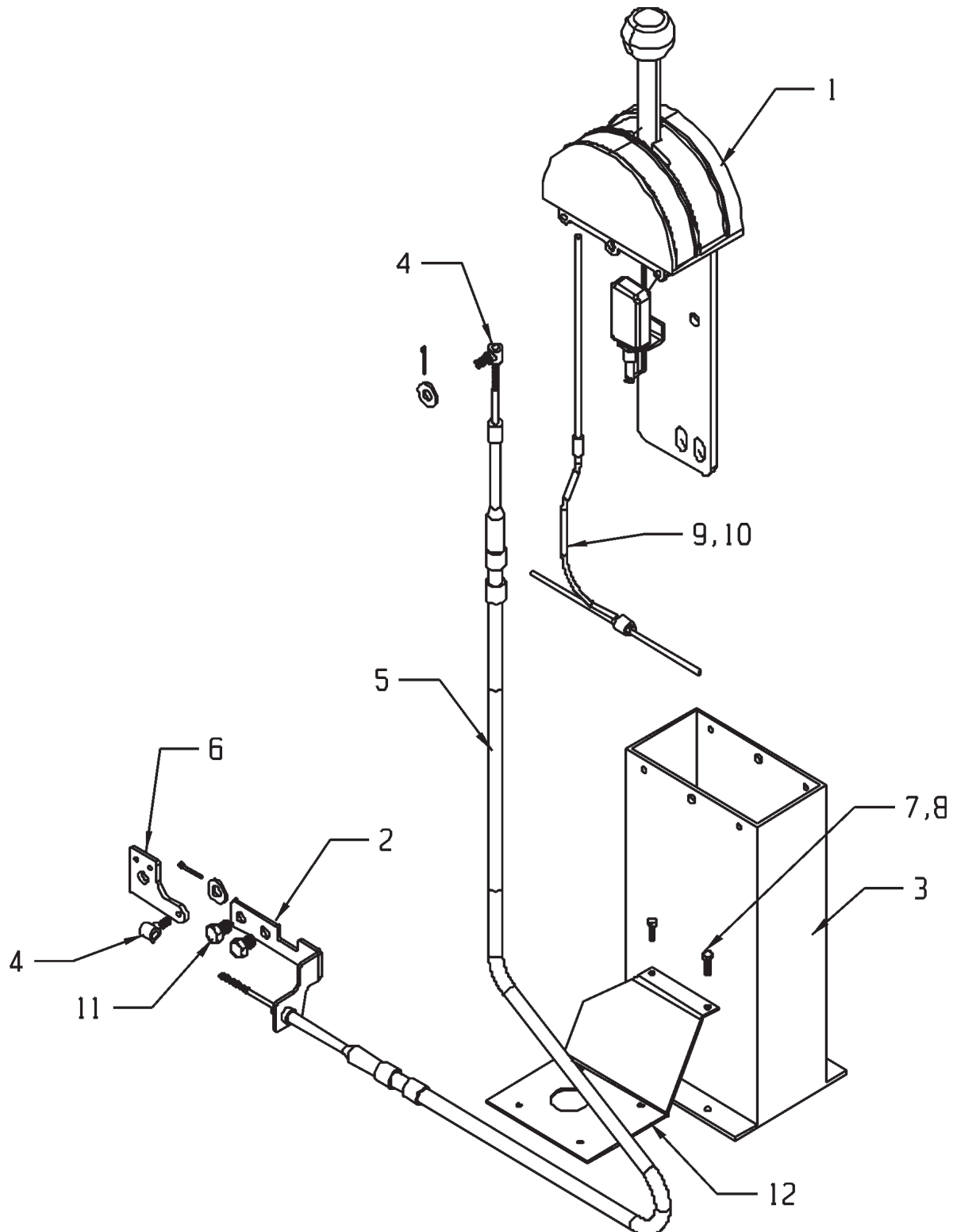


FIGURE 92.
MORSE CONTROL, OPTION - 97, DIESEL

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
92-	307543		Morse Control, DNRP, 770/402, 05+		Ref
1	306294		Shifter, Morse Control		1
2	307523		Cable Mount, Morse		1
3	1.5956		Floor stand (41625)		1
4	1.5955		Ball joint (41625)		1
5	1.6015		Cable		1
6	307524		Extension, Shifter		2
7	F017264		HHCS, 1/4-20 x 1.00		2
8	F013588		Nut, Lock, 1/4-20		6'
9	2.3437		Wire, black, 14AWG 600V THHN		6'
10	2.3478		Conduit, 1/4 Flexguard		2
11	302258		HHCS, M14 x 2.0 x 20mm		1
12	304047		Brkt, Morse Control Mntg.		1
NS	303734		Clamp Plate, Transmission Shift		1
NS	302754		Grommet		1

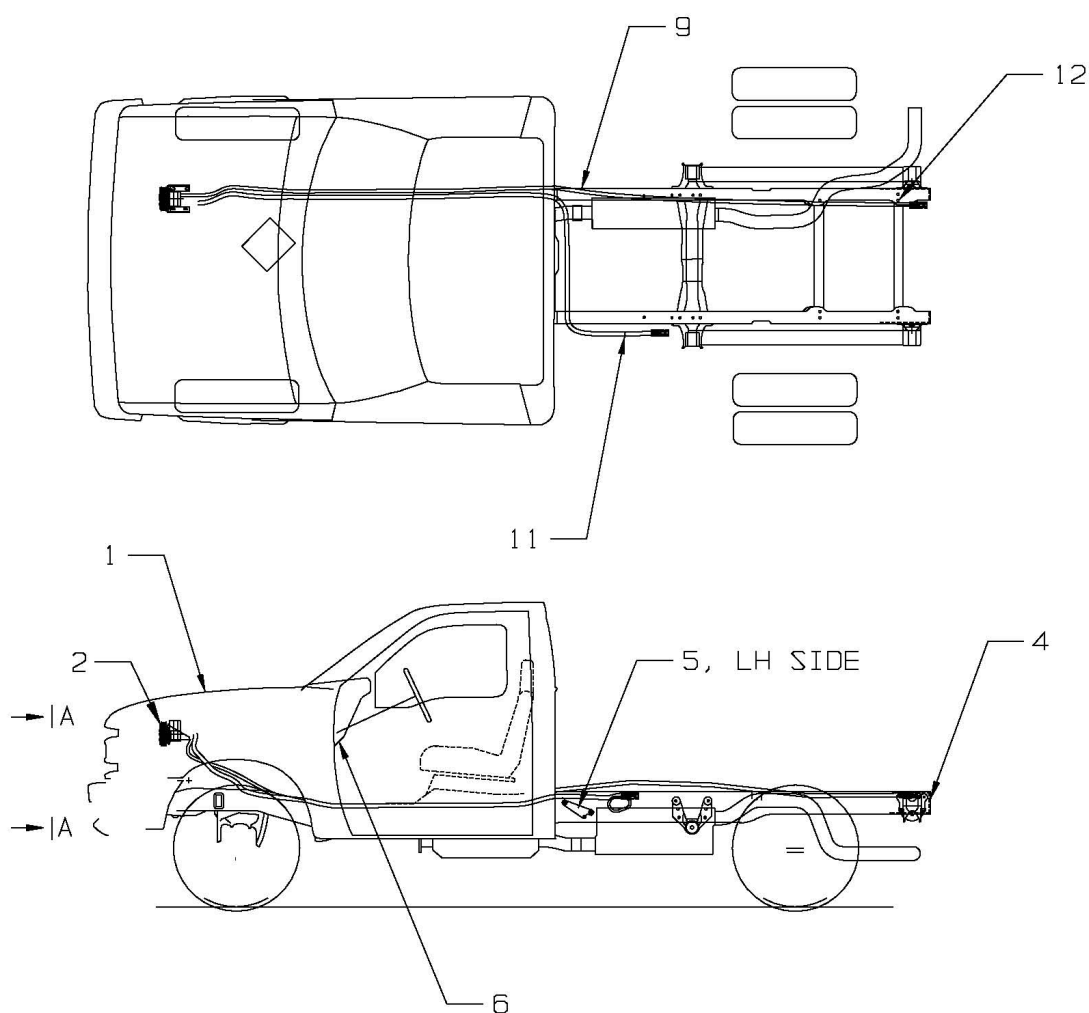
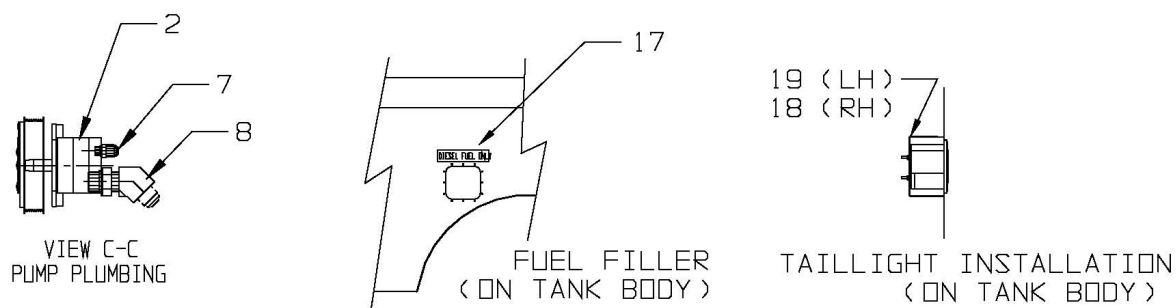


FIGURE 93.
TRUCK PREP, F350, 6.0 DIESEL, 2005 & LATER
1 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
93-	307306		Truck Prep, F350 Diesel, 2005	H	Ref
	308711		Truck Prep, F350, 6.4 Diesel, 2008		Ref
	309632		Truck Prep, F350, 6.7 Diesel, 2014	J	Ref
1	300294		Truck Chassis, F350 Diesel		Ref
	309009		Truck Chassis, F350 Diesel		Ref
2	307377		Pump Kit, w/Clutch		Ref
	308713		Pump Kit, w/Clutch		Ref
	309634		Pump Kit, w/Clutch	J	Ref
4	303920		Plate, Rear Frame Mnt		2
5	303918		Nut-Plate Wldmnt, LH Front Mtg.		1
6	303805		Cover, Control Mod, Throttle Ad		1
8	202074		Ftg, Hyd, El, 08MJ-10MB45		1
9	8946.2		Hose Assembly, #8Mx258.72"		1
10	200304		Ftg, Hyd, 12MB-16MJ45		1
11	10384.49		Hose Assembly, #16L, 251.50"		1
12	303769		HHCS, 3/8-16 X 1.5, GR 8		8
15	NW032281		HHCS, M8 X 30MM		4
17	560A89		Decal, Diesel Fuel Only		1
18	303742		Bracket, Taillight, RH		1
19	303773		Bracket, Taillight, LH		1
NS	307583		Potentiometer, 50KOHM		1
NS	303547		Out Service, Alignment, F350		1

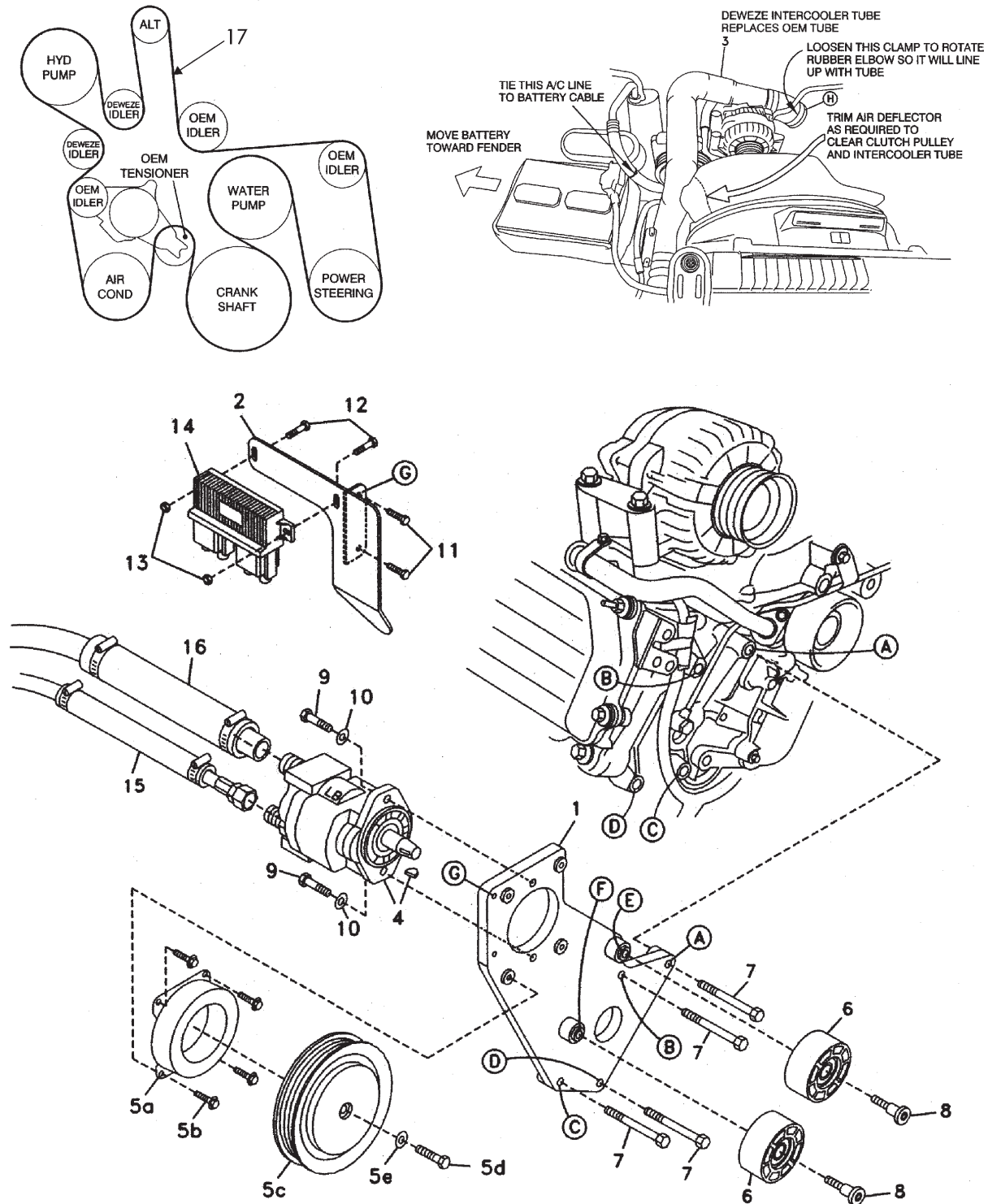


FIGURE 93.
TRUCK PREP, F350, 6.0 DIESEL, 2005 & LATER
2 OF 2

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
93-	307306		Truck Prep, F350 Diesel, 2005 & Later	H	Ref
	307377		Pump Kit w/ Clutch F350 V8		1
1		711575	Pump Mount Bracket		1
2		715007	Electrical Module Bracket		1
3		700272	Intercooler Tube		1
4			Pump		1
5		740148	Clutch		1
6	307054	740261	Idler Pulley		1
7		110488	M10 x 45 x 1.5 Bolt		4
8		110213	M10 x 40 Torx Head Shoulder Bolt		2
9	F100312	110425	3/8-16 x 1 1/4 Bolt		2
10	F100062	110676	3/8 Flat Washer		2
11		110561	1/4-20 x 3/4 Bolt		2
12		110464	1/4-20 x 1 Bolt		2
13		110609	1/4-20 Nut		2
14			Electrical Module		1
15			Insulation, Pressure Hose		1
16			Insulation, Suction Hose		1
17	307056	740360	Belt, Poly-Cog 1490KB		1

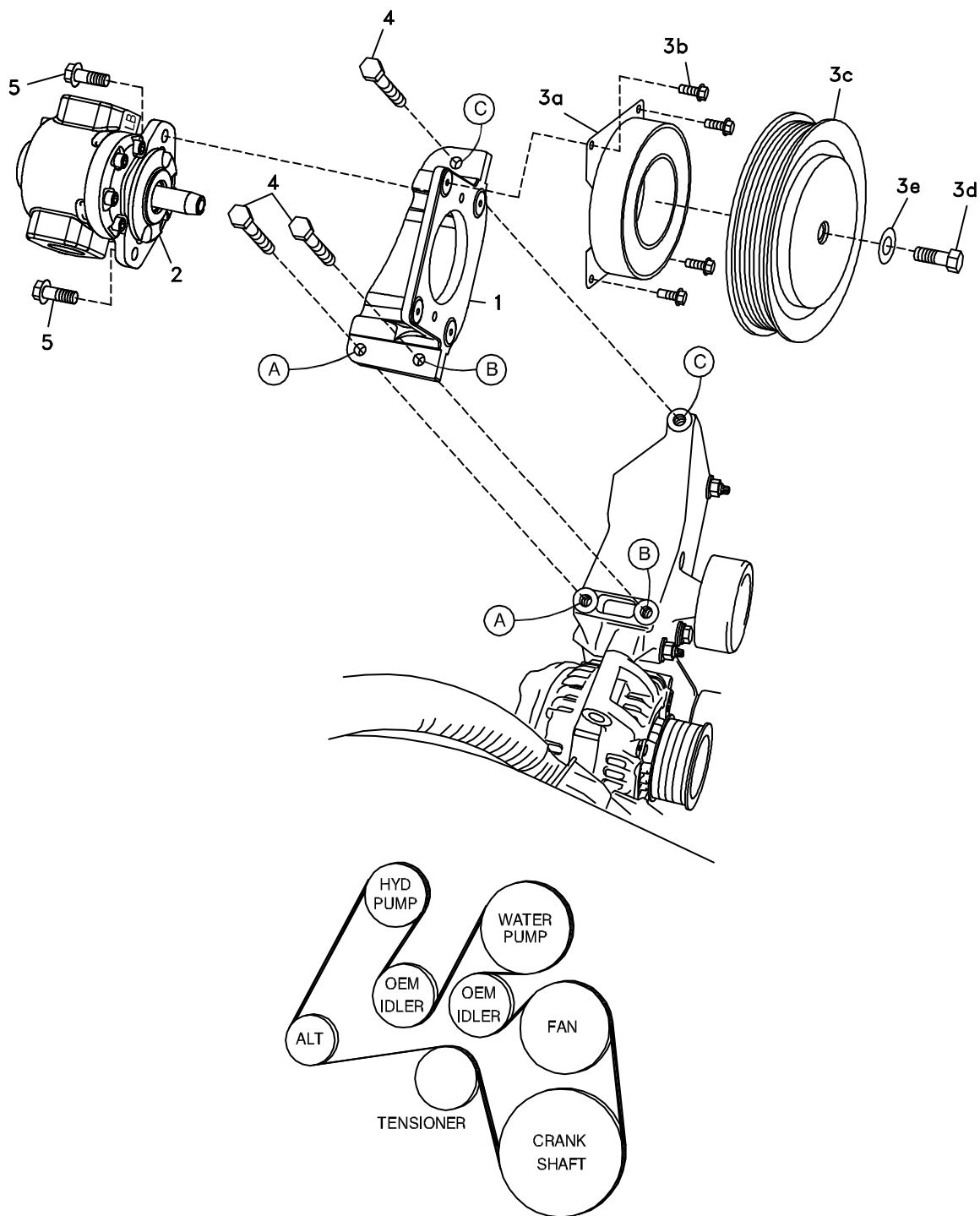


FIGURE 94.
PUMP KIT, F350, 6.4 DIESEL, 2008 & LATER

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
94-	308713		Pump Kit w/ Clutch F350 V8		1
1		711858	Pump Mount Bracket		1
2			Pump		1
3		742009	Clutch		1
4		110526	M10 x 1.5 x 40 Bolt		3
5		110440	3/8-16 a Flg Head Bolt		2
6		742053	Belt, Micro-V K081045		1

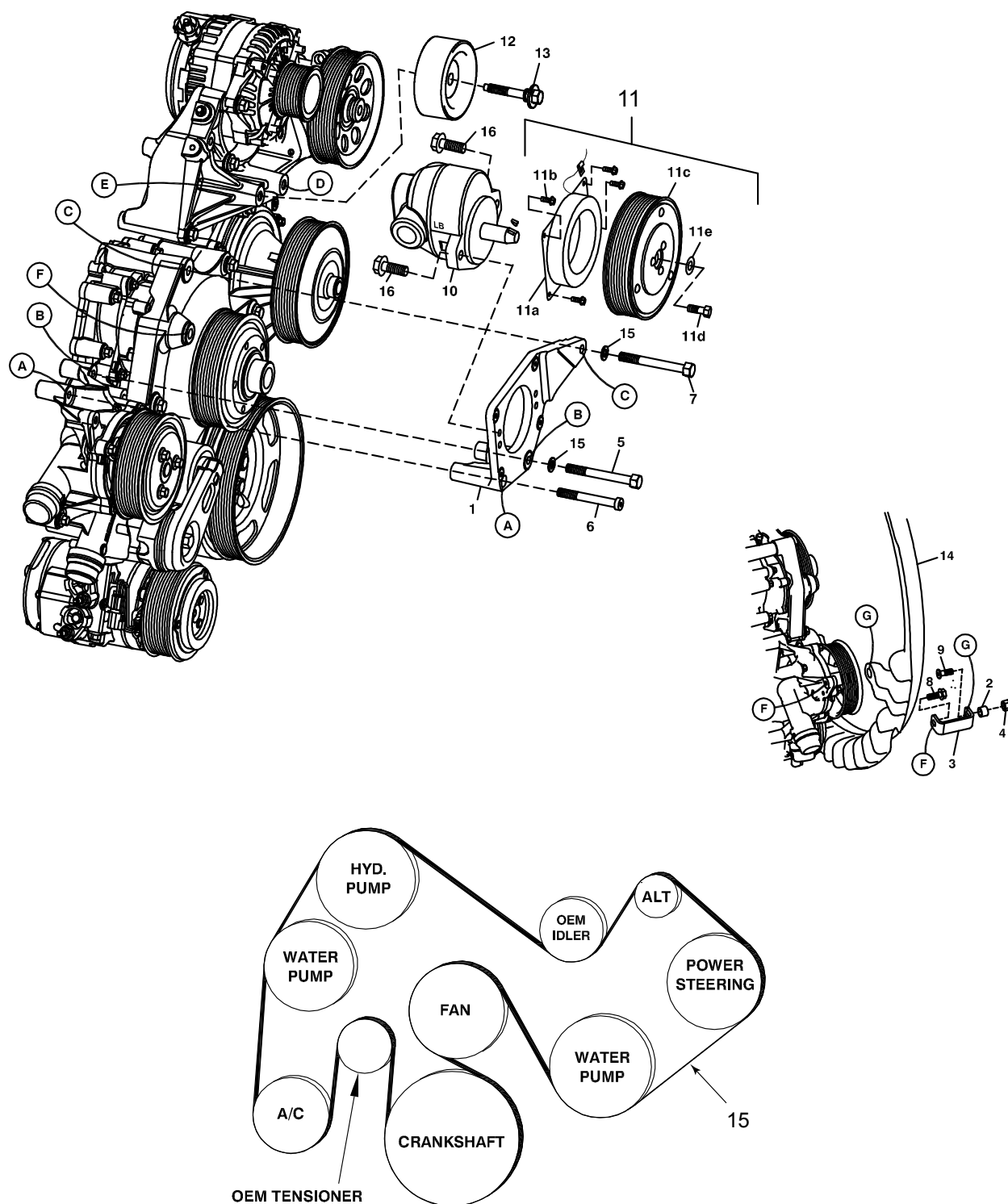


FIGURE 95.
PUMP KIT, F350, 6.7 DIESEL, 2012

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
95-	309634		Pump Kit w/ Clutch F350 V8	J	1
1		716038	Pump Mount Bracket		1
2		716040	Stator Bushing		1
3		716041	Stator Offset Clip		1
10			Pump, Side Port		1
11		742009	Clutch		1
15		742093	Belt, Poly Cog		1

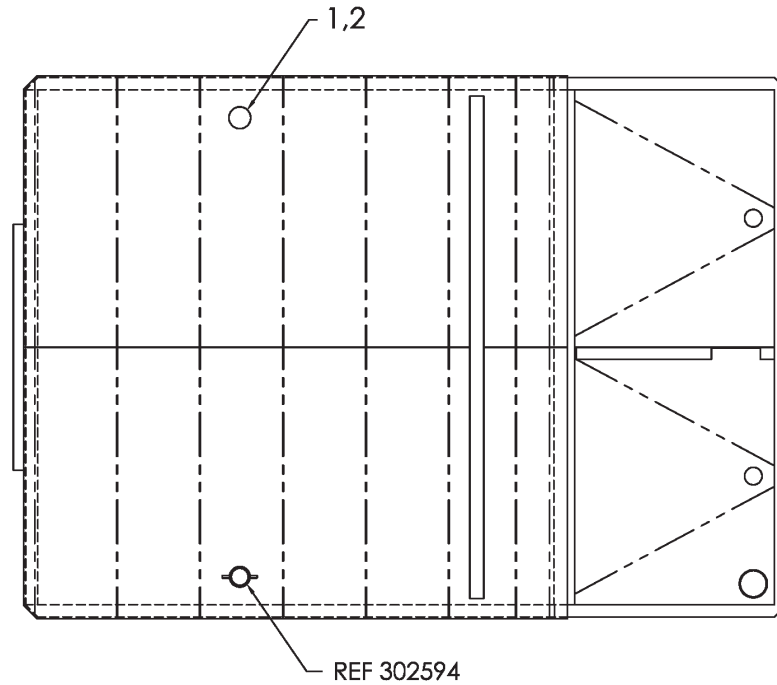


FIGURE 96.
TANK VACUUM RELIEF, OPTION

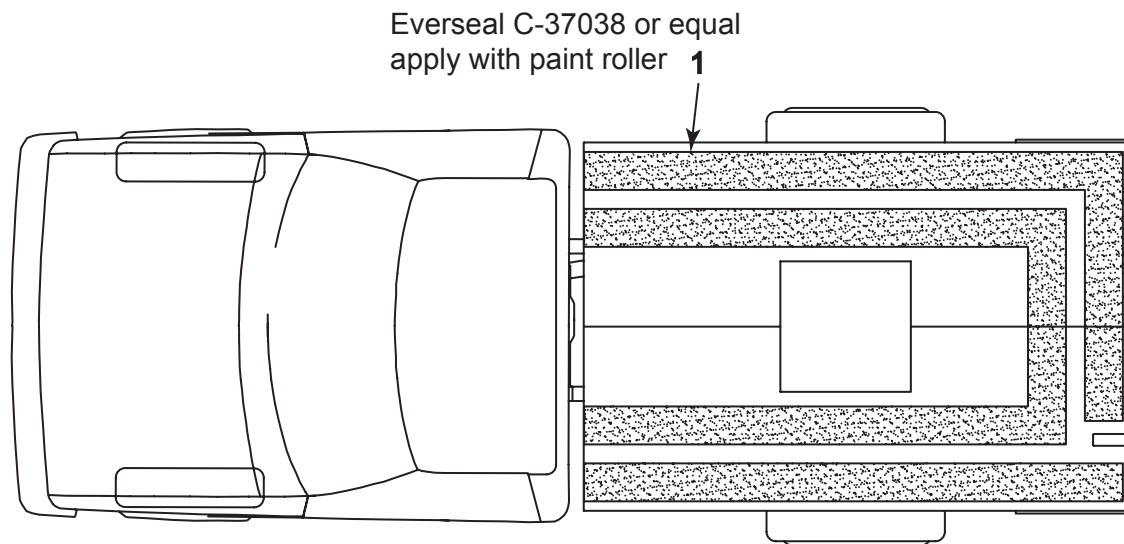


FIGURE 97.
ANTI-SKID TOP DECK, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
96-	306786		Tank Vacuum Relief, Option		Ref
1	306785		Ftg, P, 32FP-08FP, GLV		1
2	306784		Valve, Vacuum Relief		1

For reference only-this option no longer available

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
97-	309182		Anti-Skid Top Deck, Option		Ref

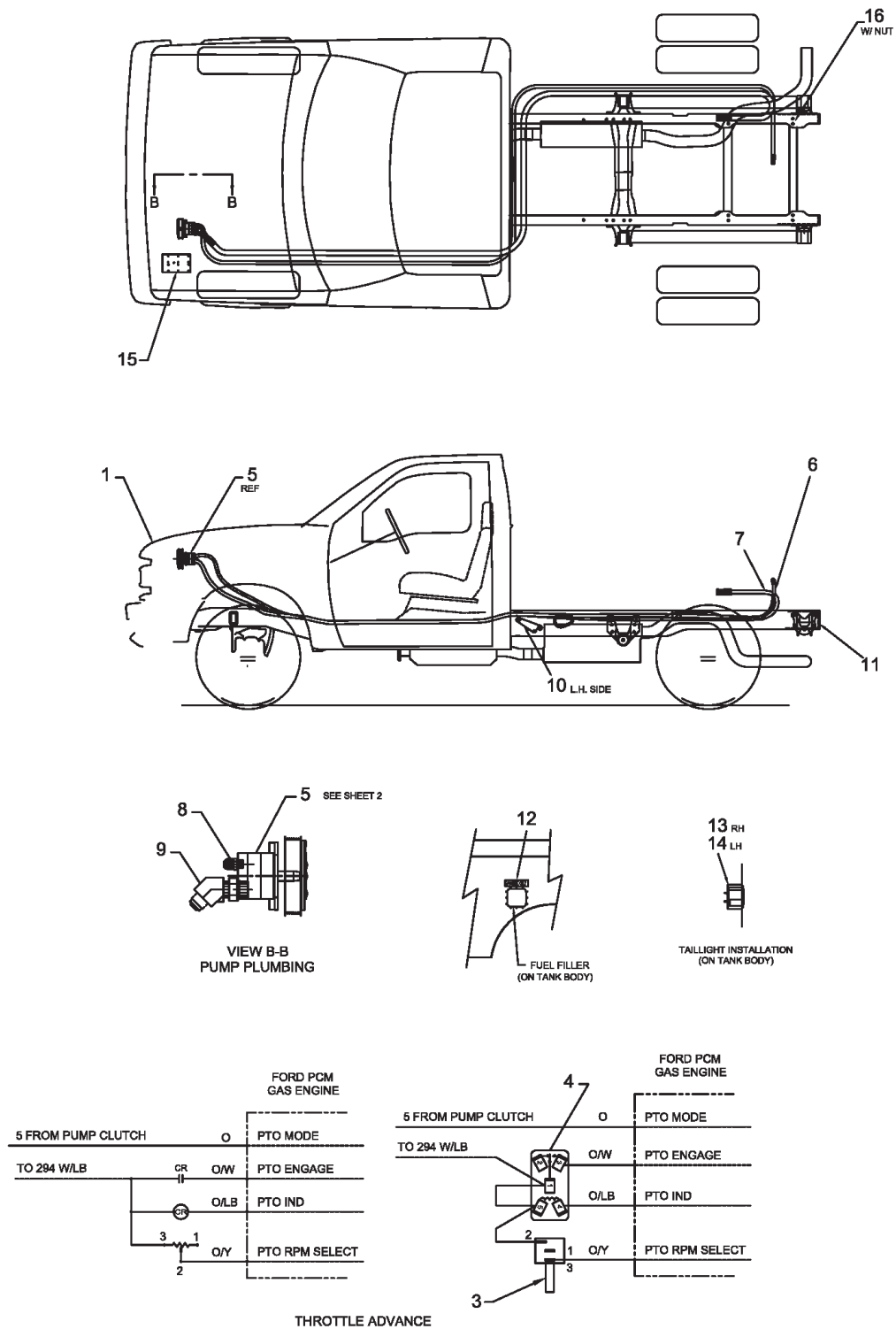


FIGURE 98.
TRUCK PREP, F350, V8 GAS 2007+

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
98-	308708		Truck Prep, F350, V8 Gas, 2007+	1	1
1	306307		Truck Chassis, F350, V10 Gas		1
3	307528		Potentiometer, 5K OHM, 3W, 10 Turn		1
4	2.3648		Relay, SPDT, 15A (Use SB502 for repairs)		1
5	308703		Pump Kit w/Clutch F350 V8, Gas		1
6	8797.92		Hose Assy, 08 x 248" ST/90		1
7	10384.49		Hose Assy, 16 x 251.5" ST/ST		1
8	3.2961		Ftg, Hyd, 08MJ-12MB		1
9	NW035809		Ftg, Hyd, 16MJ-16MB45		1
10	303918		Nut - Plate Wldmt, LH Front Mtg		1
11	303920		Plate, Rear Frame Mtg		2
12	562A279		Decal, Gasoline Only		1
13	303742		Bracket, Tailight, RH		1
14	303773		Bracket, Tailight, LH		1
15	307125		Plate, Relay Mtg		1
16	303769		HHCS 3/8-16 x 1.5 GR8		8
NS	303547		Out Svce, Alignment		1

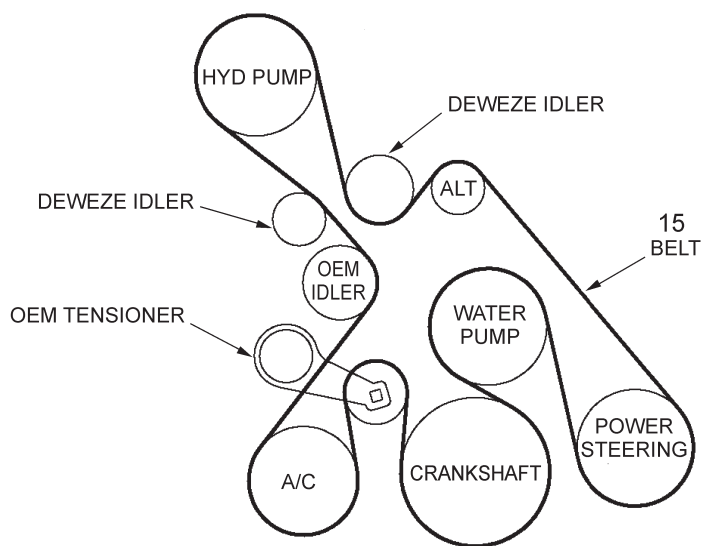
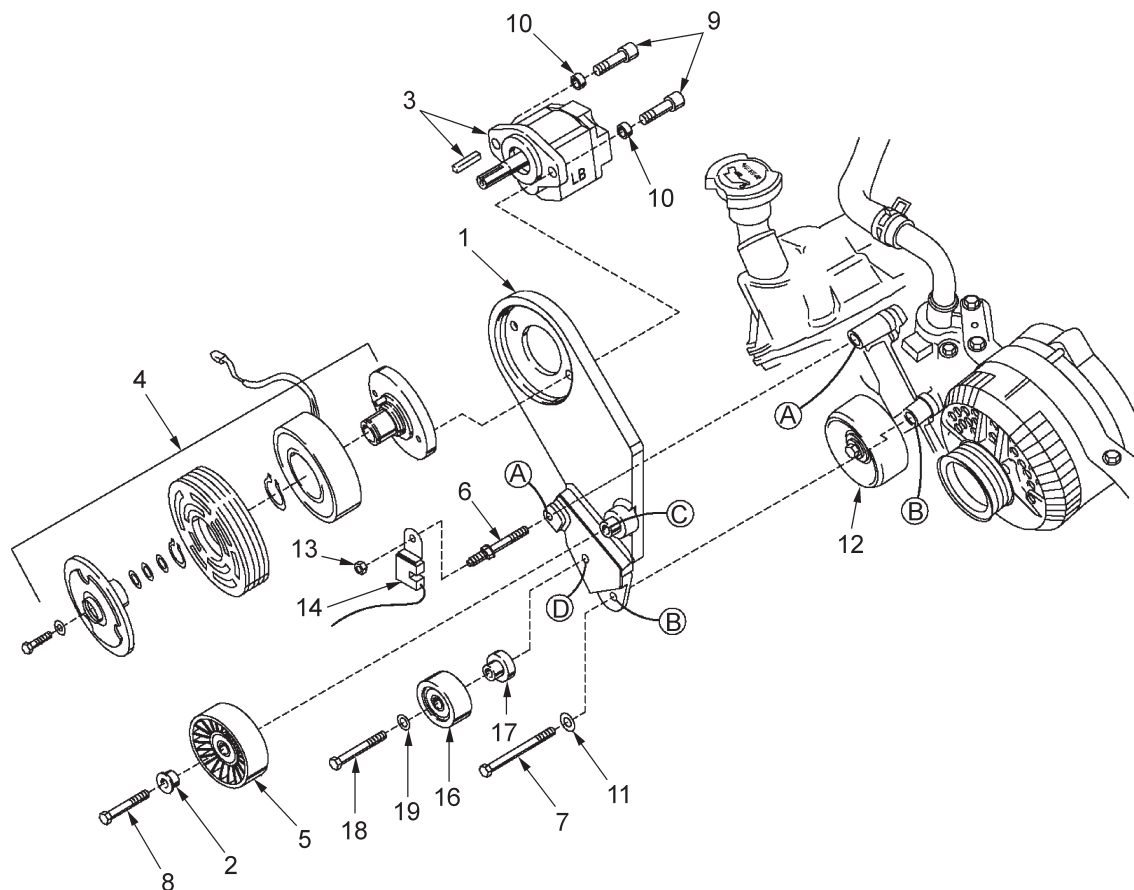
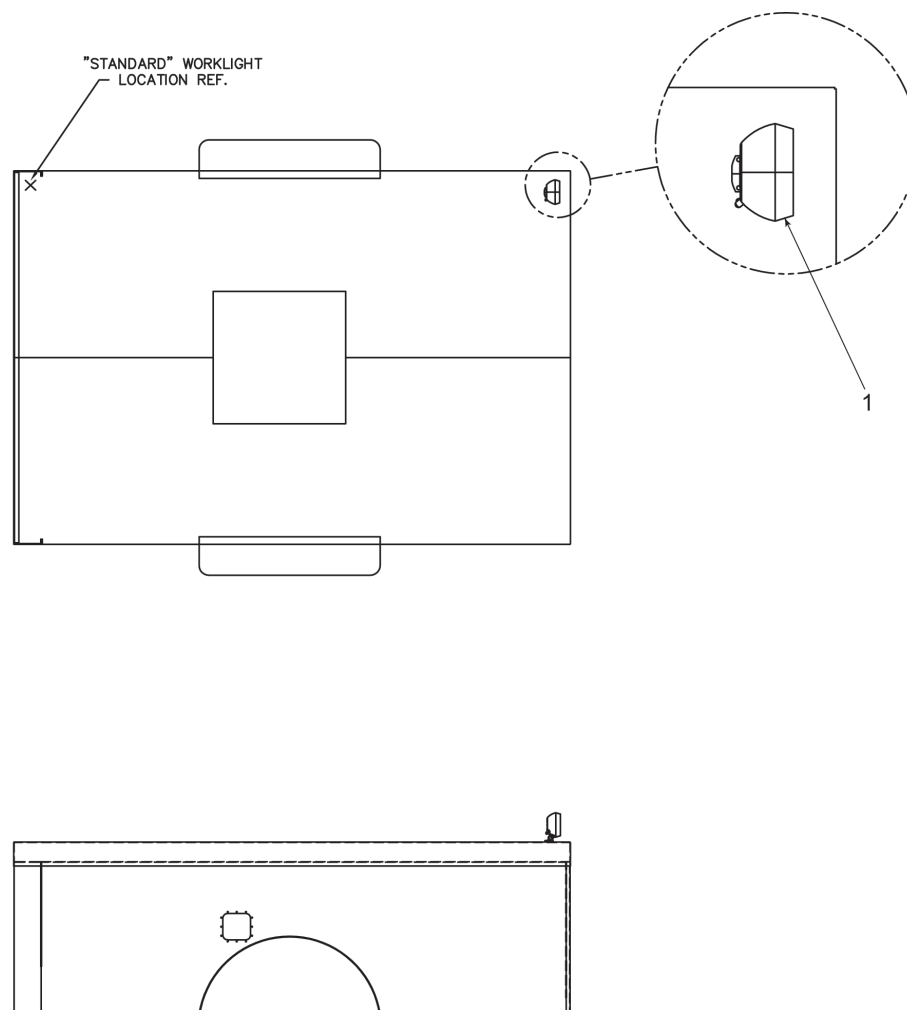


FIGURE 99.
PUMP KIT W/ CLUTCH, F350, V8 GAS 2007+

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
99-	308703		Pump Kit w/Clutch F350 V8, Gas, 2007+	1	
1	308970	711677	Pump Bracket		1
2	308971	711072	Idler Bushing		1
3	308972		Pump (rear port)		1
4	308973	740162	Clutch		1
5	308974	740389	Idler Pulley		1
6			Stud Bolt		1
7		110140	M8 X 1.25 x 60 Bolt		1
8		110479	M10 x 1.5 x 30 Bolt		1
9		110465	3/8 x 1-1/4 Socket Head Bolt		2
10		110271	3/8 Lock Washer, .55 O.D. X .13 Thick		2
11		110703	M8 Flat Washer		1
12			Idler Pulley		1
13			Nut		1
14			Wire		1
15	308975	740357	Belt, Gates 6K126.68		1
16	308976	740339	Idler Pulley		1
17	308977	711688	Idler Bushing		1
18		110488	M10 x 1.5 x 45 Bolt		1
19		110676	3/8 Flat Washer		1



**FIGURE 100.
LED WORKLITE, OPTION**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
100-	310002		Option, LED Worklight		Ref
1	309982		Assy, LED Floodlite deck		1

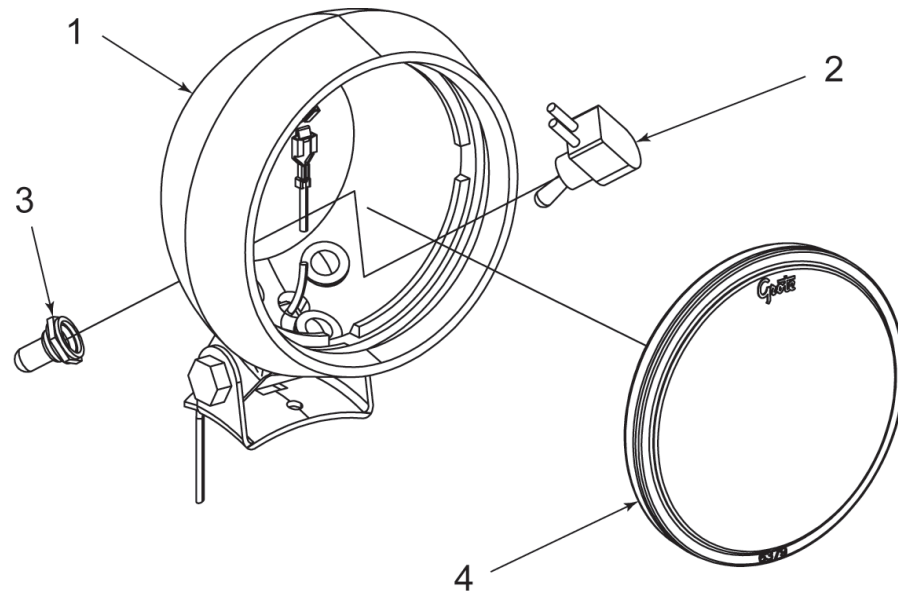


FIGURE 101.
ASSEMBLY, LED FLOODLIGHT, W/FIXED BASE

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
101-	309982		Assy, LED Floodlite w/ Fixed Base		Ref
1	309501		Housing, Light, PAR36, Rubber		1
2	2.3839		Switch, Toggle, SPST		1
3	2.1513		Boot, Switch, Toggle Silicone		1
4	309500		Bulb, Flood, LED, 12V		1

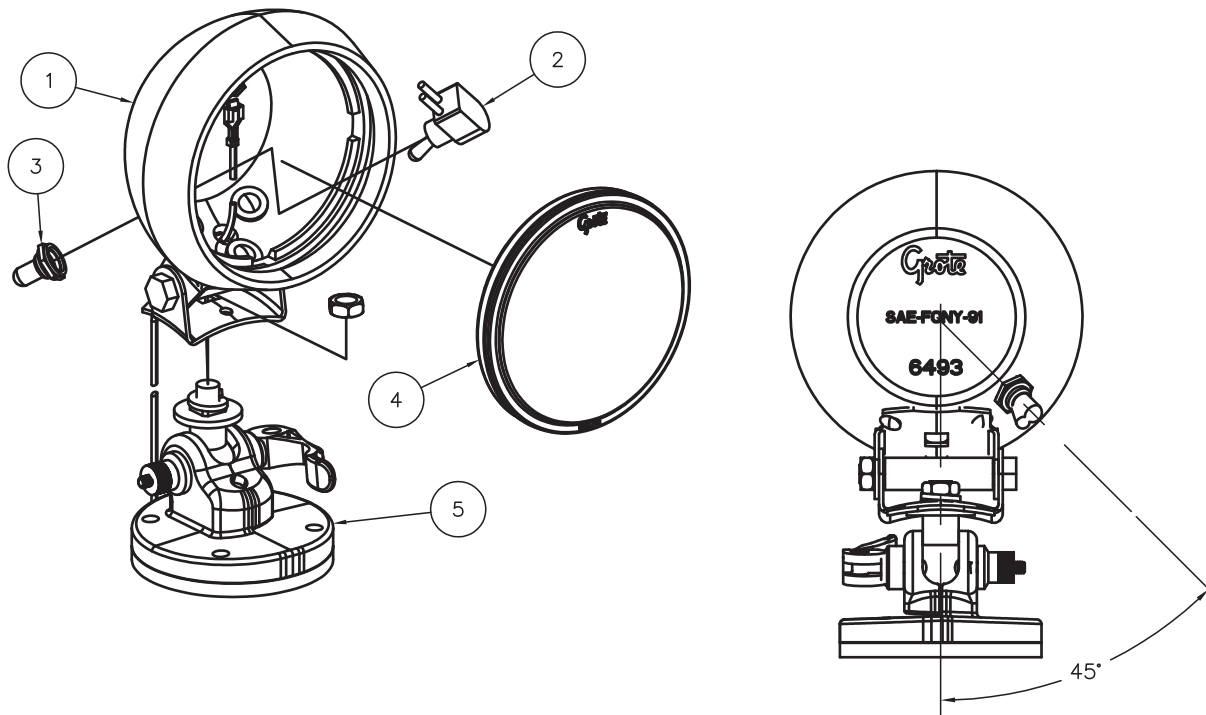
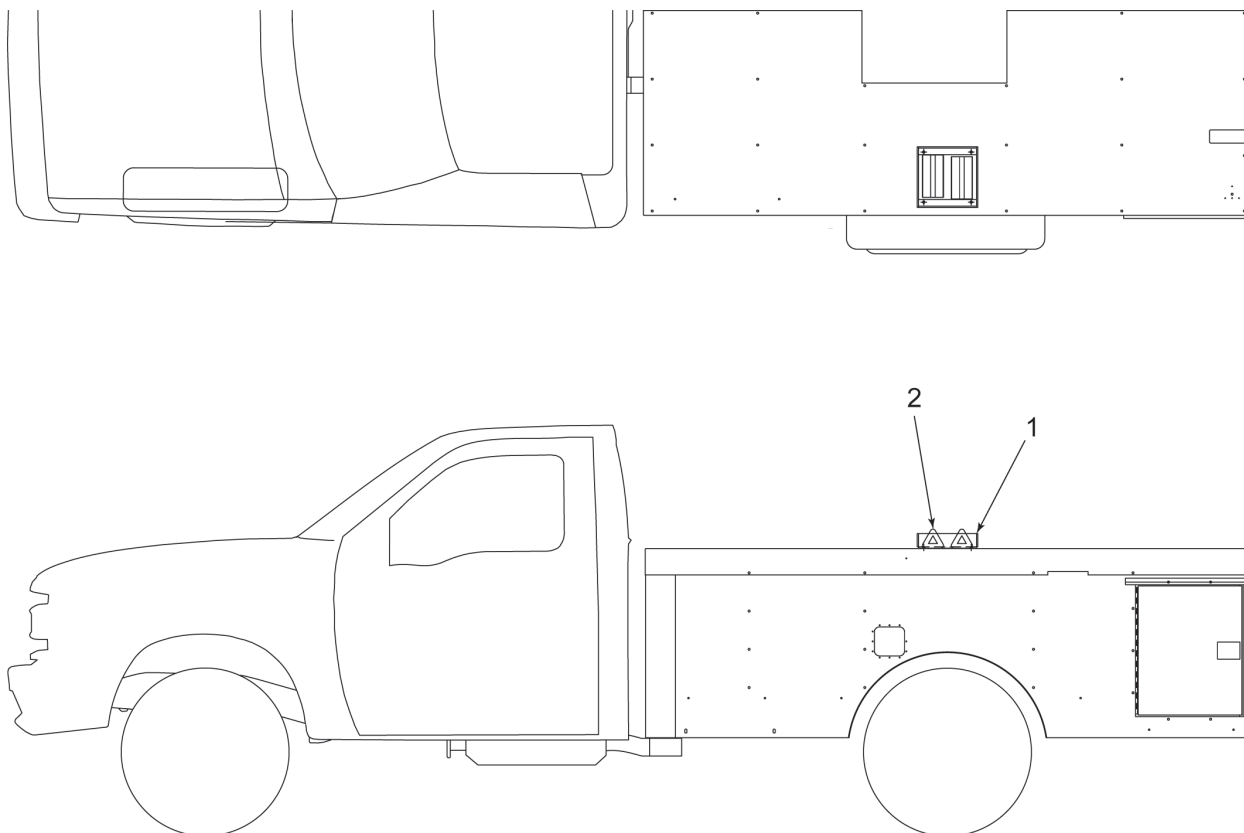


FIGURE 102.
ASSEMBLY, LED FLOODLIGHT, W/SWIVEL BASE

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
102-	309981		Assy, LED Floodlite w/ Fixed Base		Ref
1	309501		Housing, Light, PAR36, Rubber		1
2	2.3839		Switch, Toggle, SPST		1
3	2.1513		Boot, Switch, Toggle Silicone		1
4	309500		Bulb, Flood, LED, 12V		1
5	309928		Brkt, Swivel Base		1



**FIGURE 103.
WHEEL CHOCKS W/TRAY MID SIDE, OPTION**

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
103-	308954		Option, Wheel Chocks w/ Tray, Mid size		Ref
1	308955		Tray		1
2	308953		Chock, Wheel, Aircraft, 4"		1

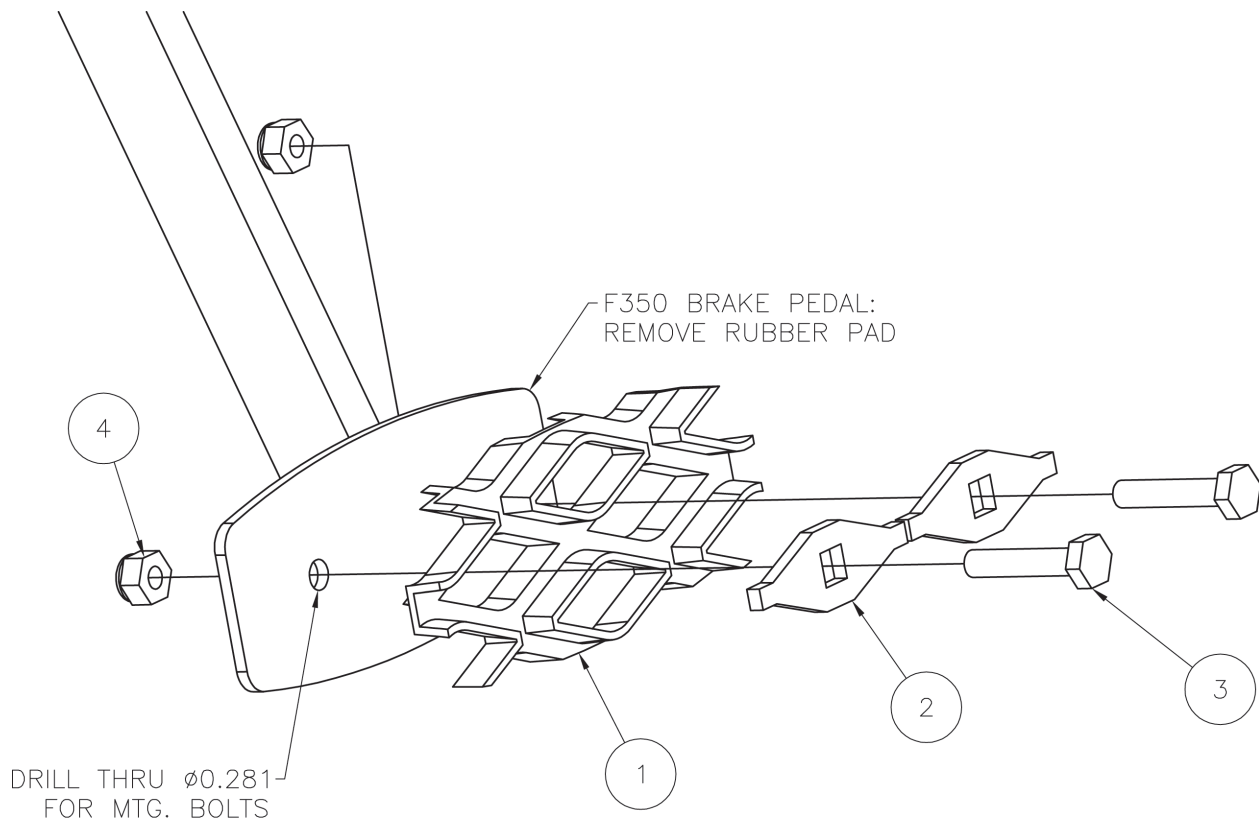


FIGURE 104.
PAD, BRAKE PEDAL, GRIPSTRUT, F350, OPTION

Fig.- Item	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
104-	309940		Pad, Brake Pedal, Gripstrut, F350, Option		Ref
1	309941		Pad, Brake Pedal, Gripstrut, F350		1
2	1.5782		Anchor, Gripstrut		2
3	F018975		HHCS 1/4-20 x 1.25, Grade 5		2
4	F013588		Nut Hex 1/4-20 Nylock		2

"Standard" worklight location Ref.

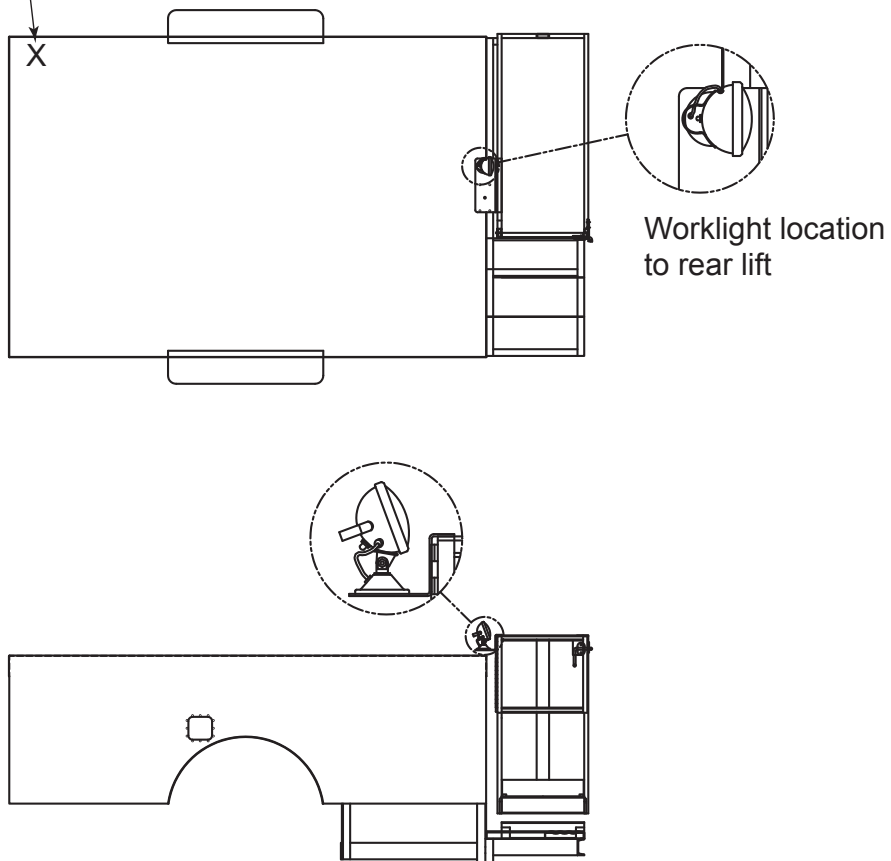


FIGURE 105.
305813 WORKLIGHT RELOCATION , OPTION

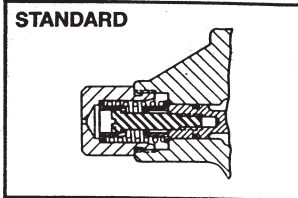
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CHAPTER 5 MANUFACTURERS INFORMATION

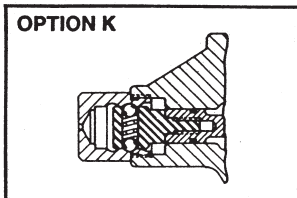
UNITED TECHNOLOGIES AUTOMOTIVE	244
ADVANCE HYDRAULICS CO.	250
DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2007+	252
308703 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2008	256
309061 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2009	260
309516 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2011	265
309993 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2014	269
307377 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2003	275
308713 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2008	279
309634 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2012	282

Optional Features

STANDARD

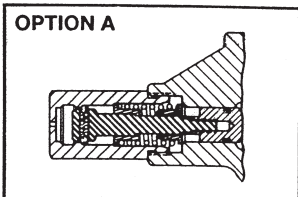


OPTION K

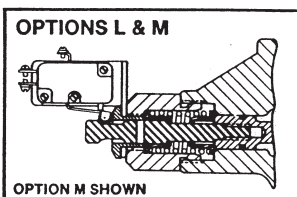


Options "L" or "M" use Limit Switch
FPS #4012100. Micro Switch #V3L-3

OPTION A



OPTIONS L & M



OPTION M SHOWN

OPTION CONVERSION KITS

"A" Detent, 2 position	6009520
"K" Detent, 2 position	6006550
"K" Detent, 3 position	6006551
"L" Limit Switch, 3 position	6008590
"M" Limit Switch, 2 position	6009340

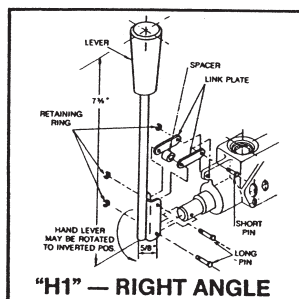
Handle Information

Assembly Instructions:

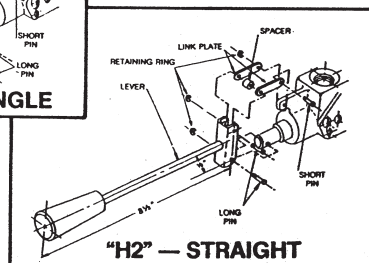
1. Assemble link plates, spacer and long pin to clevis of lever as shown. Insert retaining ring into pin groove and snap onto pin, to retain links in place.
2. Rotate spool to permit access to tang hole. Slide clevis over tang and align holes. Insert long pin and install retaining ring.
3. Rotate spool back into alignment. Hold link plates in position straddling housing rib. Insert short pin and install retaining ring.

DESCRIPTION	PART NO.
Handle Kit "H1"	6405000
Handle Kit "H2"	6405001
Handle Linkage Kit	6009261

FOR ADDITIONAL PRODUCT INFORMATION SEE BULLETIN NO. D-1.00



"H1" — RIGHT ANGLE



"H2" — STRAIGHT



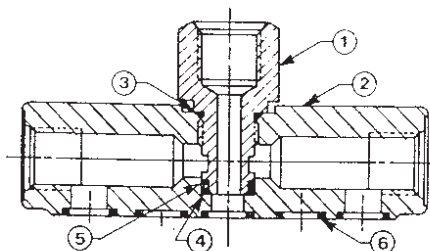
K.R. WEST CO. INC.
909 Hyland Ave.
P.O. Box 468
Kaukauna, WI 54130
(414) 766-0113

UNITED TECHNOLOGIES AUTOMOTIVE

Outlets

OUTLET KITS		
SO	Open Center	6402000
SC	Closed Center (Use closed center plug)	6402003
PB	Power Beyond	6402001
DTO	Dual Tank Outlet Open Center	6402002
DTC	Dual Tank Outlet Closed Center	6402004
NO	Standard Outlet w/Reverse Check	6402005

OUTLET WITH POWER BEYOND



Seal Kits & Banking Kits

O-RING CROSS-REFERENCE				SEAL KITS*				
FPS No.	DASH No.	DURO.	MATERIAL	A	B	C	D	E
0101012	-012	70	Buna-N	1	1	1		1
0101013	-013	70	Buna-N			5	5	5
0101014	-014	70	Buna-N					
0101015	-015	70	Buna-N	2	1			
0101018	-018	70	Buna-N		1			
0101112	-112	70	Buna-N		2	1		
0102906	-906	90	Buna-N					1
0106008	-008	70	Buna-N					
0108008	Back up ring							
0115012	Quad ring							1
0220012	Back up ring							1
4023150	Mylar Shim					3		

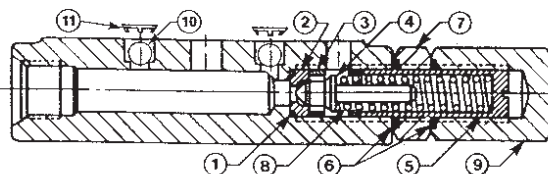
NO. OF VALVE BANKS	BANKING KITS*		TIE RODS		
	STANDARD	COLLECTOR PLATE (1)	STANDARD	COLLECTOR PLATE (1)	COLLECTOR PLATE (2)
1	6404001		4023771		
2	6404002	6404003	4023774	4023776	
3	6404003	6404004	4023776	4023778	4023778
4	6404004	6404005	4023778	4023780	4023780
5	6404005	6404006	4023780	4023783	4023783
6	6404006	6404007	4023783	4023784	4023784
7	6404007	6404008	4023784	4023787	4023787
8	6404008		4023787		

Inlets

INLET KITS

Standard Inlet with Load Checks	NI	6401003
Dual Inlet with Load Checks	NDIP	6401011
Reverse Inlet with Load Checks	NRI	6401010
Priority Inlet with Relief & 0-500 Load Checks	NPR	6401013
Priority Inlet with Relief and 500-3000 Load Checks	NPR	6401015
Load Check and Relief (50-500)	NR	6401006
Load Check and Relief (500-3000)	NR	6401007

INLET WITH RELIEF



Valve Sections

SPOOL TYPE	STANDARD PART NO.	VALVE SECTIONS/LESS HANDLES			
		DETENTS		LIMIT SWITCH	
		OPERATING POS.	CENTER POS.	3 POSITION	2 POSITION
		K	A	L	M
10	6400000	6400003	6400001	6400004	6400005
14	6400040	6400043	6400041	6400044	6400045
17	6400010	6400013	6400011	6400014	6400015
25*	6400050	6400053			64000155
28	6400080	6400083			6400085
29	6400090	6400093			6400095
34	6400006				
20	6400020	6400023			6400025

Isolator Plate	IP	6403001
Series Conversion Plate	SP	6403002

Assembly:

1. Inspect all parts before assembly. Remove any nicks or burrs from body and spool with fine crocus cloth.
2. Lubricate all O-Rings with clean oil.
3. Replace O-Ring (11) in bore on handle end of body. Use spool in body to guide O-Ring into groove. Make sure O-Ring is not twisted in groove.
4. Replace O-Ring (6) on spool making sure it is not twisted.
5. Replace spring centering or detent assembly on end of spool. Torque to 30 in. lbs. (see details on page 6).
6. Lubricate spool with clean hydraulic system oil. Place spool in its bore with a slight twisting action; this will allow the O-Rings to compress and will prevent possibilities of the O-Ring shearing.
7. Replace the spring centering or detent cap. To ease assembly of detents, extend the spool slightly out of the body, assemble balls and spring on the spool; then screw detent cap into the body.

Note:

"L" or "M" limit switch (see page 6). Attach the switch bracket with the bushing nut. If the switch does not operate properly, it may be adjusted with the two screws that mount the switch to the bracket. **Caution:** Excessive tightening of switch mounting screws may crack switch housing.

8. Replace the handle assemblies. (See page 6 for instructions and part numbers.)
9. Install one nut (1) on each tie rod (9). Place two tie rods through the mounting bracket (2). Place one flat washer (3) on the third tie rod. Push the tie rods through the outlet section (4). An aid in banking sections is to place the mounting bracket in a vice or on the edge of a flat surface with the tie rods in a vertical position. Place one mylar shim (5) over each tie rod and push them down onto the outlet sections. Place 5 O-Rings (7). Install a valve section over the tie rods. Place the O-Rings (7) and mylar shims (5) on this section. Replace remaining section as above.

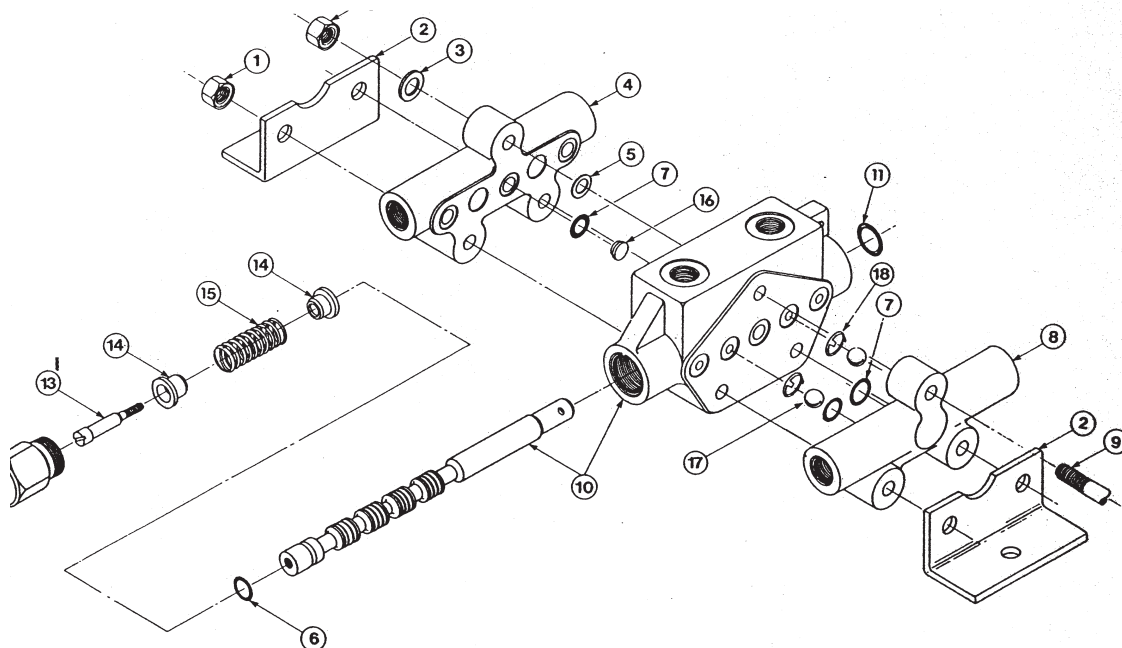
Load checks (see page 4). Before installing O-Rings in the section next to the inlet, place the ball retainer (prongs up) in the flow passages on both sides of the **center flow passage**, not the two outboard passages. Place the O-Rings (7) in the counter-bores. Place the mylar shims, one over each tie rod, on the section. Then, stand the ball on the retainers.

10. Install the inlet section (8). Place the mounting bracket (2) over the lower tie rods and install the nuts (1). Place the flat washer (3) over the top tie rod and install the nut (1).
11. Torque the tie rods in three steps of 50 in. lbs., 90 in. lbs., and finally 115 in. lbs. **THIS IS VERY IMPORTANT! OVERTORQUEING WILL CAUSE BORE DISTORTION & MAY CAUSE SPOOL BINDING OR INCREASED LEAKAGE.**
12. In order to set the relief, if installed, the complete valve must be put on a test stand capable of flow from 1 to 8 GPM. Remove the cap over the adjustment screw and loosen the lock nut (see page 4). Set incoming pressure on test stand to desired valve setting and adjust screw in to increase relief setting or out to decrease relief setting. Setting is correct when 1 GPM flows out of valve at desired pressure.
13. If painting of the valve is required, make sure all ports are plugged, handles are removed, and spools masked.

FPS Midget Valves

Maintenance and service bulletin

D-1.91
March 1, 1988



Parts List

Item	Part No.	Description	Item	Part No.	Description	Item	Part No.	Description
1.	1005013	Nut	7.	0101013	O-ring (10 req'd)	13.	4010520	Spring shaft
2.	4014240	Mounting bracket	8.	See Page 4	Inlet section	14.	4010530	Spring guide
3.	1008008	Washer	9.	See Page 5	Tie rod	15.	—	Spring
4.	See Page 5	Outlet section	10.	See Page 4	Body & spool S/A	16.	4011702	Closed center plug
5.	4023150	Mylar shim (between section)	11.	0101112	O-ring (in-body)	17.	1022018	Ball
6.	0101012	O-ring (1 req'd)	12.	4010500	Spring cap	18.	4022901	Retainer



COMPONENTS DIVISION
FLUID POWER SYSTEMS

Assembly Information

Disassembly:

Note:

Before attempting to disassemble this or any other hydraulic component prepare a clean work area.

1. Remove nuts (1), mounting bracket (2) and washer (3) from inlet end of valve bank.

Note:

When removing inlet section (see page 4, inlet illustration) watch for check balls, which will fall free from inlet section when removed. Also, remove ball retainers from inlet side of the first valve section.

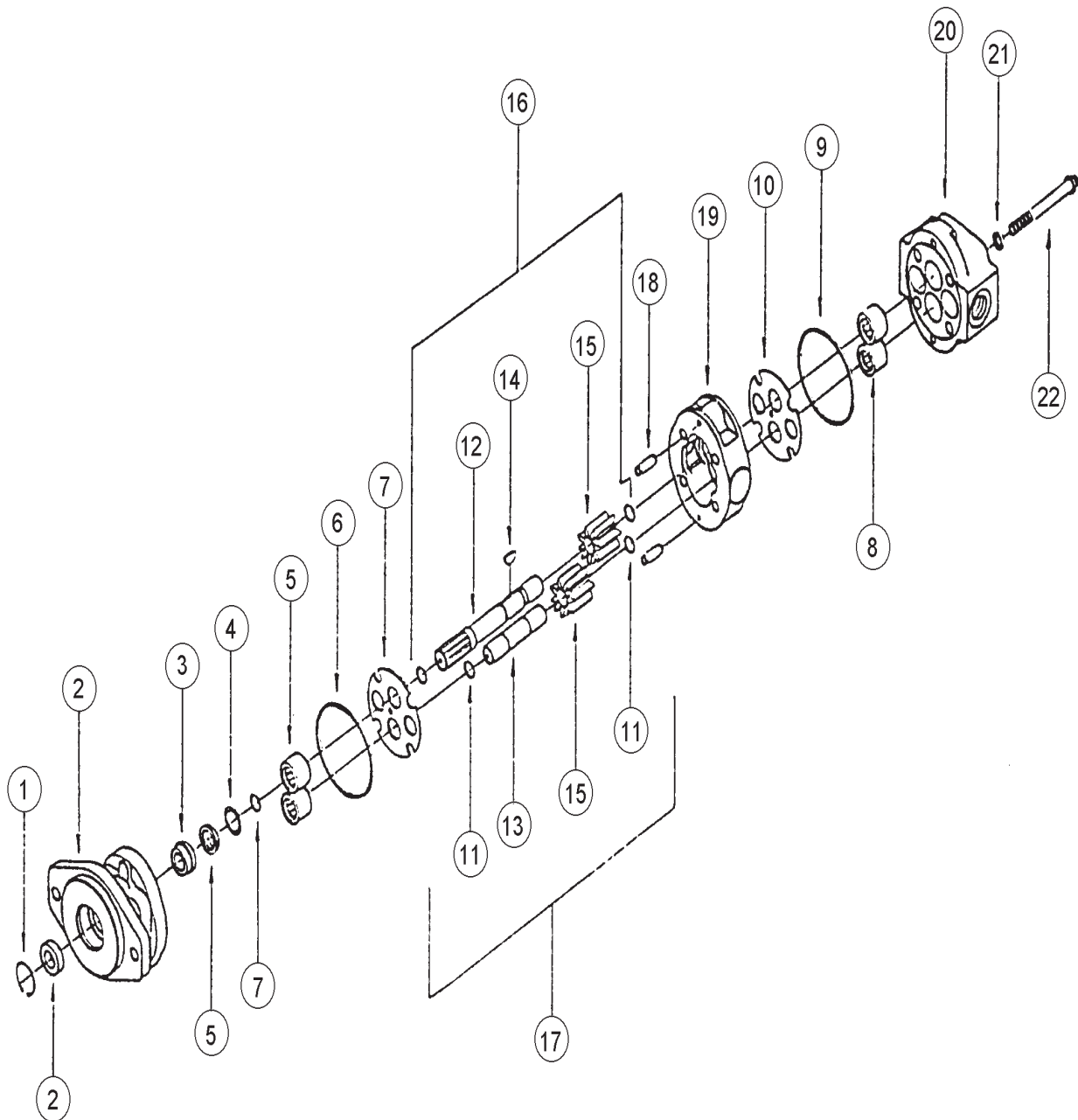
2. Remove the inlet section (8). Between the inlet (8), each center section and the outlet (4), are three mylar shims (5), one over each tie rod (9). Keep these shims, as they will be needed during assembly.
3. Remove valve sections, one at a time, removing O-Rings (6) and mylar shims (5) between each section.
4. After valve bank is completely disassembled remove handle assemblies.

Note:

34 (4TH POSITION FLOAT) VALVE SECTIONS ONLY ARE NOT FIELD SERVICE-ABLE. If any problems occur, return complete valve sections to the factory for repairs.

For "L" or "M" options only, limit switch must be removed before removing spring cap (see page 6, optional L & M for details).

5. Remove the spring cap (12) from the valve section. On detented spool sections the detent balls and spring may jump out of the detent cap.
6. Remove the spool from the body by pushing on handle end. **KEEP BODY AND SPOOL TOGETHER, AS THEY ARE A MATCHED SET.**
7. Remove O-Rings (11), from inside bore on handle end of body.
8. To remove the O-Ring (6) on the spool, first remove the spring centering or detent assembly, then the O-Ring.
9. Wash all parts in clean solvent, then dry with a low pressure air hose.

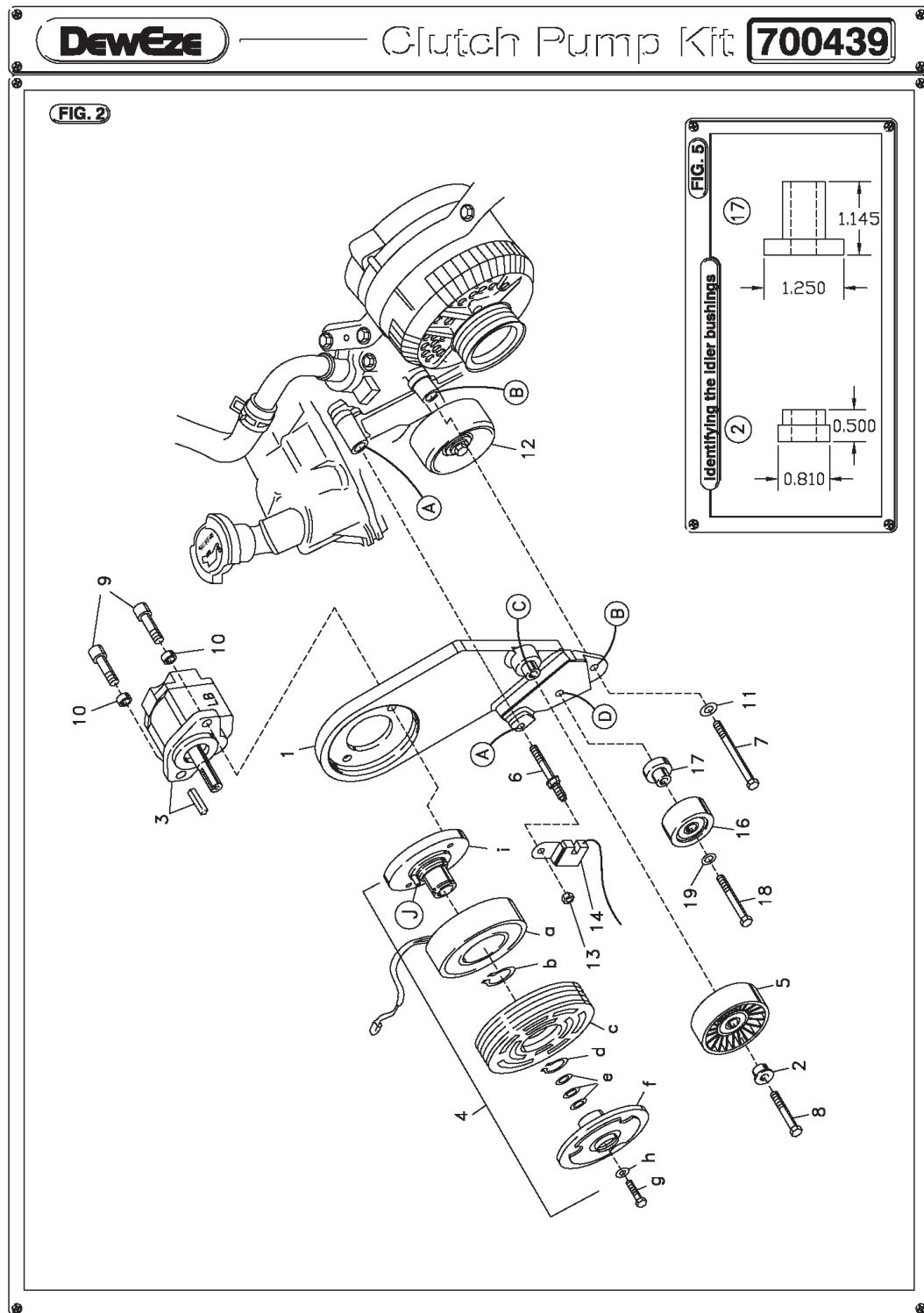


ADVANCE HYDRAULICS CO.

Item	Airline Use	NMC Wollard Part No.	Vendor Part No.	Nomenclature	Eff	Units Per Assy
		1.0664	HD1515-C1-C11	Pump, Hydraulic (V02892)		REF
1			A515X022	Retainer © design)		1
2			A334X020	Bearing © design)		1
3			2X15X***	Adapter		1
4			11X15X1	Seat, Seal		1
5			N15-10	Seal Assembly		1
6			A408X017	Washer		1
7			812X49	Retainer		1
8			A340X041	Bearing		4
9			A395X065	O-Ring		2
10			12X15X2	Wear Plate		2
11			812X49	Retainer		4
12			4X1515X***	Drive Shaft		1
13			5X1515X***	Driven Shaft		1
14			A258X005	Key		1
15			6X1515X1	Gear		2
16			20X1515X***	Drive Shaft Assembly		1
17			21X1515X***	Driven Shaft Assembly		1
18			A550X002	Dowel Pin		4
19			1X1515X***	Housing		1
20			3X15X***	Cover		1
21			A419X006	Washer		4
22			***	Bolt		4

Clutch Pump Kft 700439																																																																			
Ford, 5.4L:G, F-350, A/C, AA Pump, Rear Port																																																																			
Bolt Packages: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Bracket</td> <td>None</td> </tr> <tr> <td>Idler pulley</td> <td>711678 (Inc. 2, 8, 17-19)</td> </tr> <tr> <td>Pulley</td> <td>None</td> </tr> <tr> <td>Tensioner</td> <td>None</td> </tr> </table>	Bracket	None	Idler pulley	711678 (Inc. 2, 8, 17-19)	Pulley	None	Tensioner	None	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Bracket Assy.</td> <td>None (Inc. items)</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>Issue Date</td> <td>3-30-05</td> </tr> <tr> <td>Revision Date</td> <td>NC 3-30-05</td> </tr> </table>	Bracket Assy.	None (Inc. items)							Issue Date	3-30-05	Revision Date	NC 3-30-05																																														
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FIG. 1 BELT DIAGRAM																																																																			
(A),(B),(C)... Denotes bolt holes in engine to locate corresponding holes in Pump Brkt. © HARPER INDUSTRIES 2004																																																																			

DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2007+



DewEze

Clutch Pump Kit
#700439
Ford 5.4L
with A/C
'AA' mount
2005+

INSTALLATION INSTRUCTIONS

1. Disconnect the battery.
2. Remove the OEM belt. Remove the fan shroud and fan.
3. Remove OEM idler pulley (12) to gain access to mounting bolt at location B. Keep the pulley and bolt.
4. Remove nut (13) holding wire at location A. Remove stud bolt (6) at location A. Remove OEM bolt at location B.
5. Hold pump (3) onto back of bracket (1) and clutch hub (4i) onto front of bracket, making sure anti-rotation pin (D) on front of hub is on top. Place two 3/8 x 1 1/4 socket head bolts (9) and 3/8 high collar lock washers (10) through pump, through mounting plate and thread into hub. Torque to 20 lb-ft.
6. Slide coil (4a) over hub, aligning hole in the back plate of coil with the anti-rotation pin (D) in the hub. The wires from the coil should be on the same side as the pin (D). Install large snap ring (4b) to hold coil in place.
NOTE: THE BEVEL ON BOTH SNAP RINGS MUST FACE AWAY FROM THE PUMP. REFER TO INSTRUCTION SHEET FOR THE CLUTCH FOR CORRECT INSTALLATION OF SNAP RINGS.
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NOTE: SET THE AIR GAP BETWEEN THE HUB/ARMATURE AND THE PULLEY USING SHIMS (4e) ACCORDING TO INSTRUCTION SHEET FOR CLUTCH.
9. Thread bolt (4g) and lock washer (4h) into pump shaft. Torque to value in clutch instruction sheet.
10. Install the fittings on the pump.
11. Insert the short idler bushing (2) into the 3" dia. idler pulley (5) and attach the other side to the boss on the front of the pump mount bracket (1) at Location C with the M10 x 30 shoulder bolt (8). Torque to 19-25 ft-lb.
12. Insert the longer idler bushing (17) into the beveled side of the 2" dia. idler pulley (16) and attach to the pump bracket at Location D with the M10 x 45 (18) bolt with a 3/8 flat washer (19). Torque to 19-25 ft-lb.
13. See Fig. 3. Disconnect the wiring from the alternator, pull it from the attachment points on the valve cover and push it back on top of the valve cover. Make sure the alternator wiring will not be pinched between the engine and the pump bracket when it is installed.
14. Attach the pump mount bracket (1) to the engine with the OEM stud bolt (6) at Location A and the M8 x 60 bolt at Location B. Torque these bolts to 19-25 ft-lb.
15. Replace the wire (14) on the stud bolt (9) rotating it 180 degrees from the OEM position so it points away from the pump bracket so it is not in the belt line. See Fig. 4. Reconnect wires to the alternator.
16. Reinstall OEM idler (12) using the OEM bolt in its original location. Torque to 19-25 ft-lb.
17. Install the serpentine pump drive belt (15) per diagram.
18. Connect the battery.
19. Run the engine and check for any clearance or alignment problems. Adjust as needed.

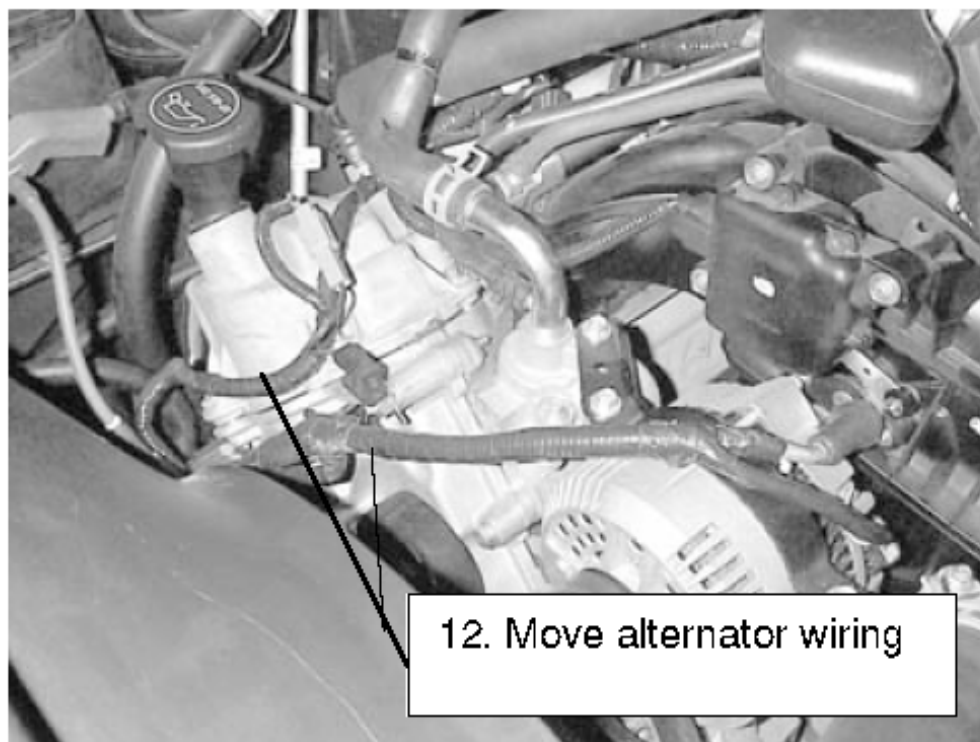


Fig. 3

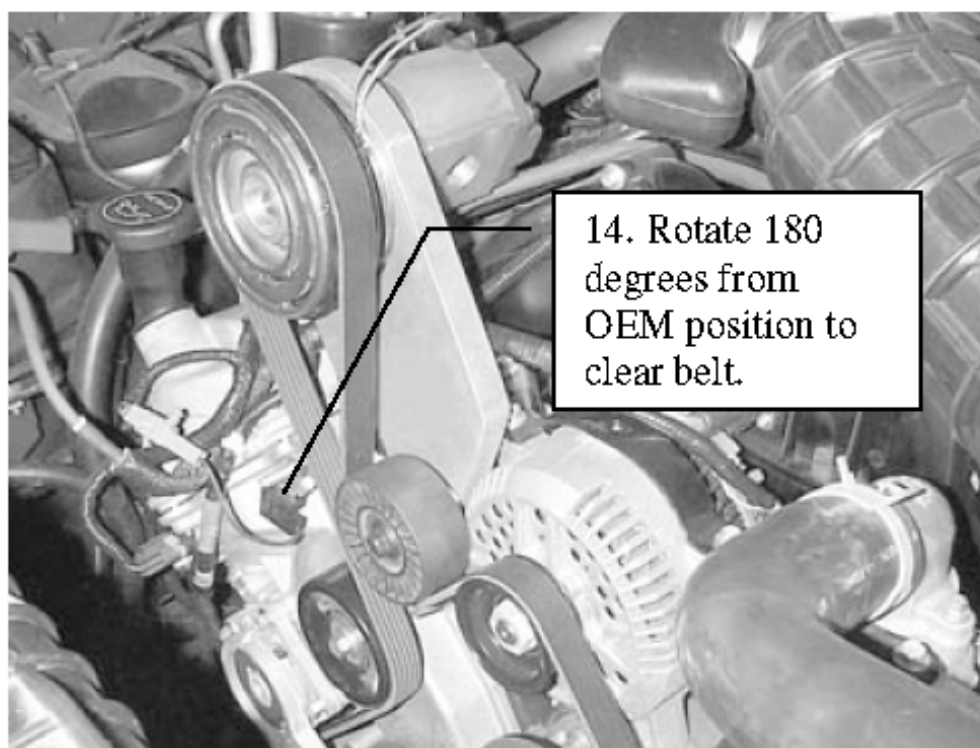
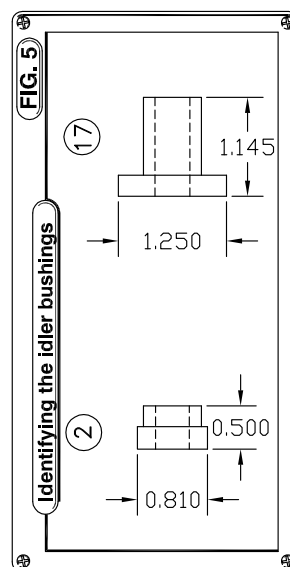
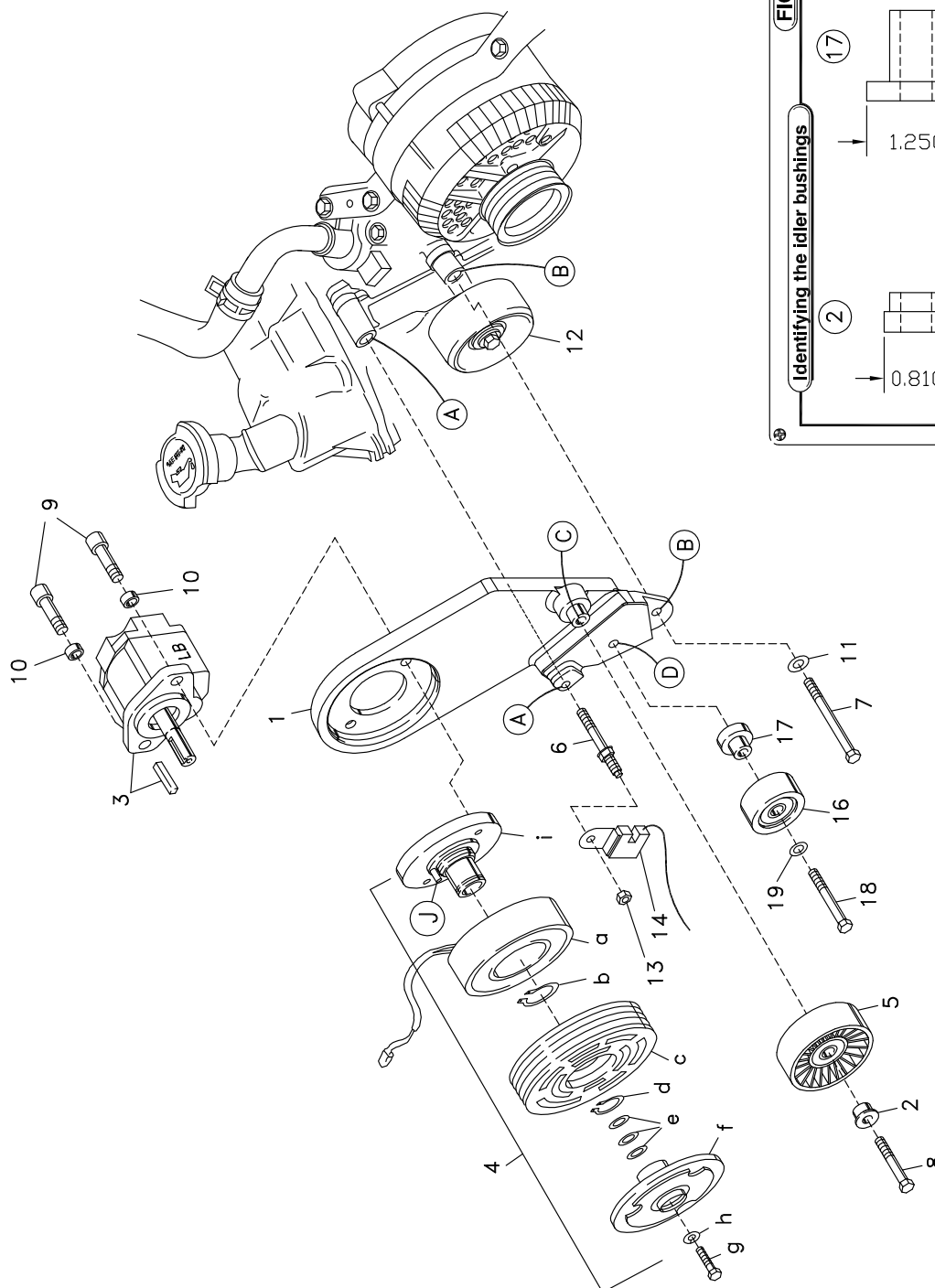


Fig. 4

Clutch Pump Kit 700481																																																													
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308703 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2008

FIG. 2



DEWEZE

Clutch Pump Kit
#700481
Ford 5.4L
No A/C
'AA' mount
2005 +

INSTALLATION INSTRUCTIONS

1. Disconnect the battery.
2. Remove the OEM belt. Remove the fan shroud and fan.
3. Remove OEM idler pulley (12) to gain access to mounting bolt at location B. Keep the pulley and bolt.
4. Remove nut (13) holding wire at location A. Remove stud bolt (6) at location A. Remove OEM bolt at location B.
5. Hold pump (3) onto back of bracket (1) and clutch hub (4i) onto front of bracket, making sure anti-rotation pin (D) on front of hub is on top. Place two 3/8 x 1 1/4 socket head bolts (9) and 3/8 high collar lock washers (10) through pump, through mounting plate and thread into hub. Torque to 20 lb-ft.
6. Slide coil (4a) over hub, aligning hole in the back plate of coil with the anti-rotation pin (D) in the hub. The wires from the coil should be on the same side as the pin (D). Install large snap ring (4b) to hold coil in place.
NOTE: THE BEVEL ON BOTH SNAP RINGS MUST FACE AWAY FROM THE PUMP. REFER TO INSTRUCTION SHEET FOR THE CLUTCH FOR CORRECT INSTALLATION OF SNAP RINGS.
7. Slide clutch pulley (4c) onto hub. Install small snap ring (4d) to hold pulley in place.
8. Place the key (3) onto the pump shaft. Slide the hub/armature (4f) onto the pump shaft aligning the keyways.
NOTE: SET THE AIR GAP BETWEEN THE HUB/ARMATURE AND THE PULLEY USING SHIMS (4e) ACCORDING TO INSTRUCTION SHEET FOR CLUTCH.
9. Thread bolt (4g) and lock washer (4h) into pump shaft. Torque to value in clutch instruction sheet.
10. Install the fittings on the pump.
11. Insert the short idler bushing (2) into the 3" dia. idler pulley (5) and attach the other side to the boss on the front of the pump mount bracket (1) at Location C with the M10 x 30 shoulder bolt (8). Torque to 19-25 ft-lb.
12. Insert the longer idler bushing (17) into the beveled side of the 2" dia. idler pulley (16) and attach to the pump bracket at Location D with the M10 x 45 (18) bolt with a 3/8 flat washer (19). Torque to 19-25 ft-lb.
13. See Fig. 3. Disconnect the wiring from the alternator, pull it from the attachment points on the valve cover and push it back on top of the valve cover. Make sure the alternator wiring will not be pinched between the engine and the pump bracket when it is installed.
14. Attach the pump mount bracket (1) to the engine with the OEM stud bolt (6) at Location A and the M8 x 60 bolt at Location B. Torque these bolts to 19-25 ft-lb.
15. Replace the wire (14) on the stud bolt (9) rotating it 180 degrees from the OEM position so it points away from the pump bracket so it is not in the belt line. See Fig. 4. Reconnect wires to the alternator.
16. Reinstall OEM idler (12) using the OEM bolt in its original location. Torque to 19-25 ft-lb.
17. Install the serpentine pump drive belt (15) per diagram.
18. Connect the battery.
19. Run the engine and check for any clearance or alignment problems. Adjust as needed.

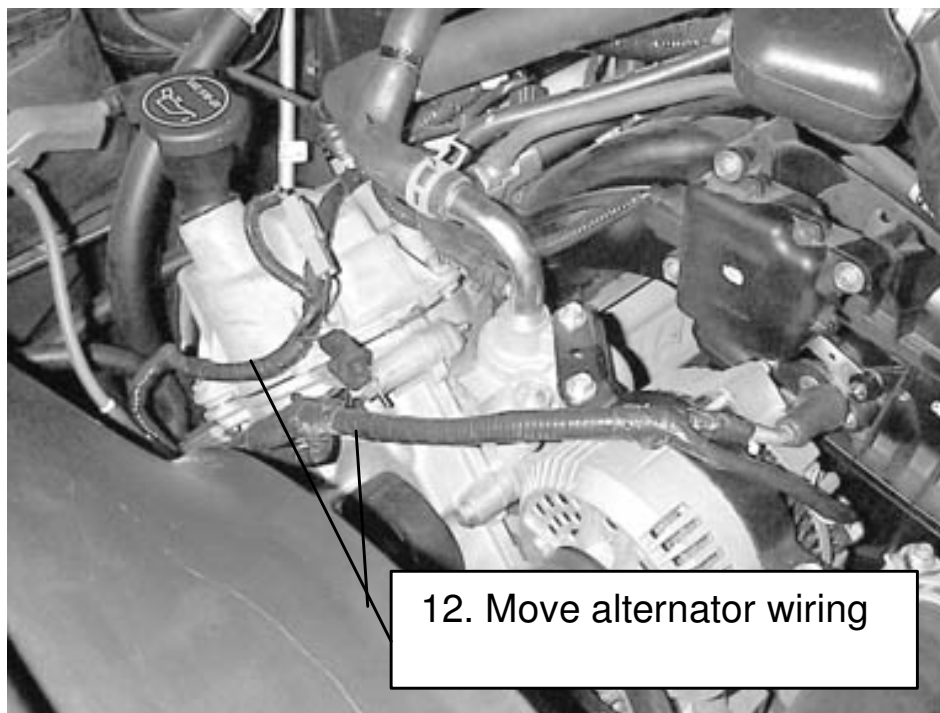


Fig. 3

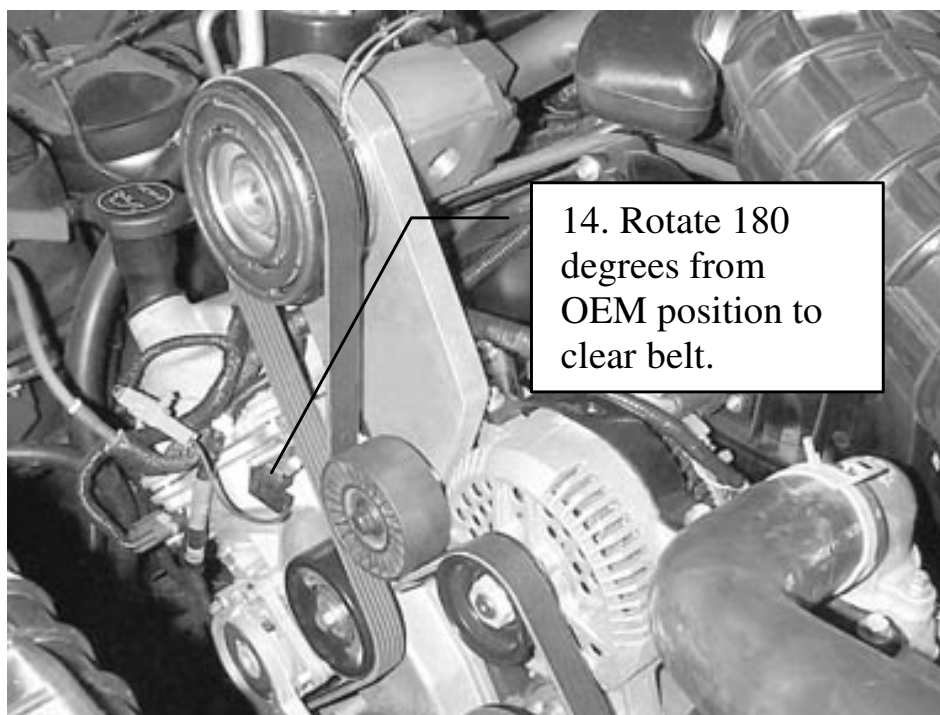


Fig. 4

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309061 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2009

DEWEZE

Clutch Pump Kit

700535

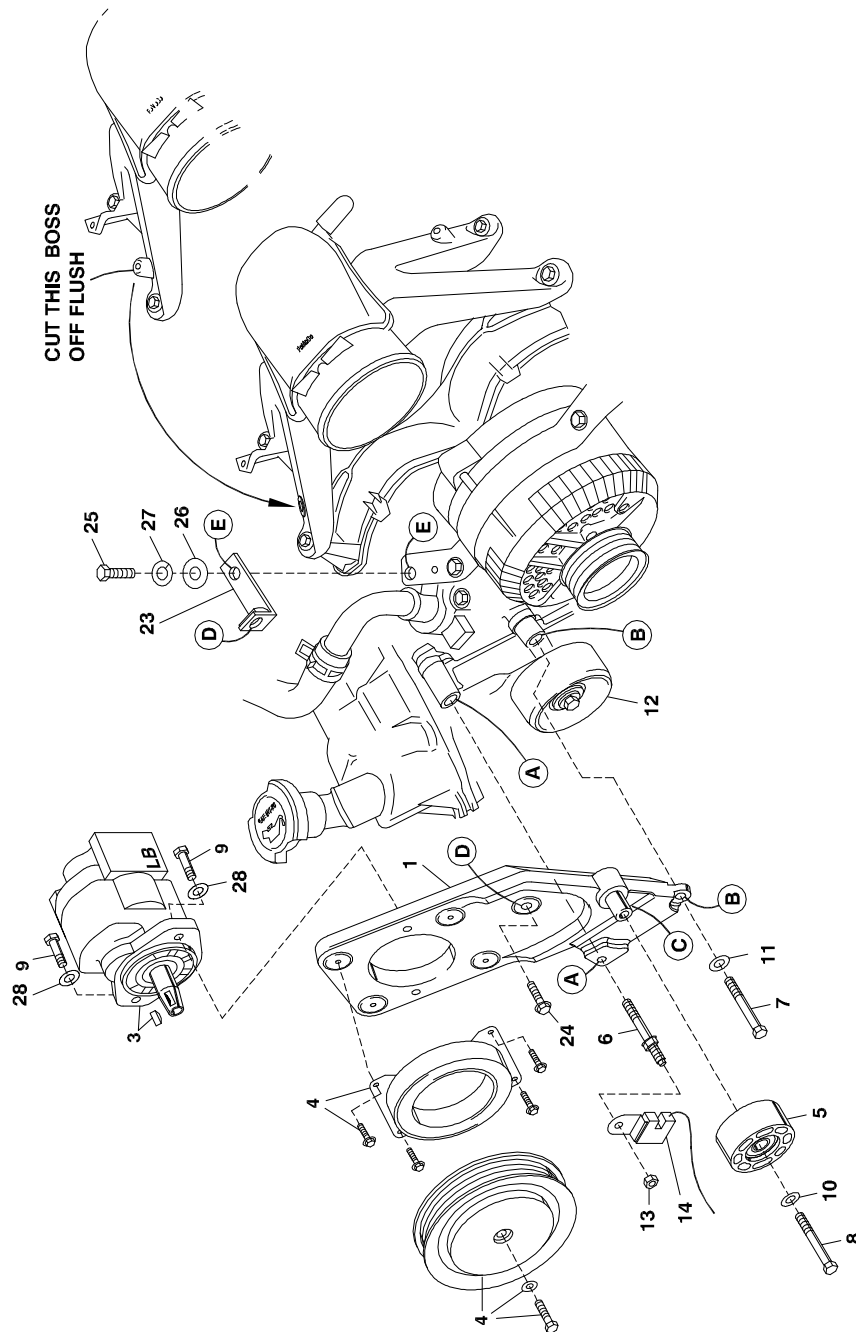


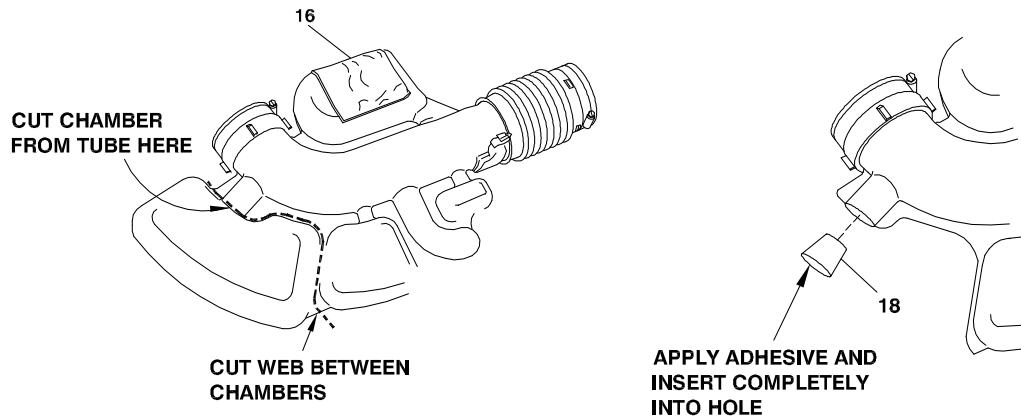
FIG. 2

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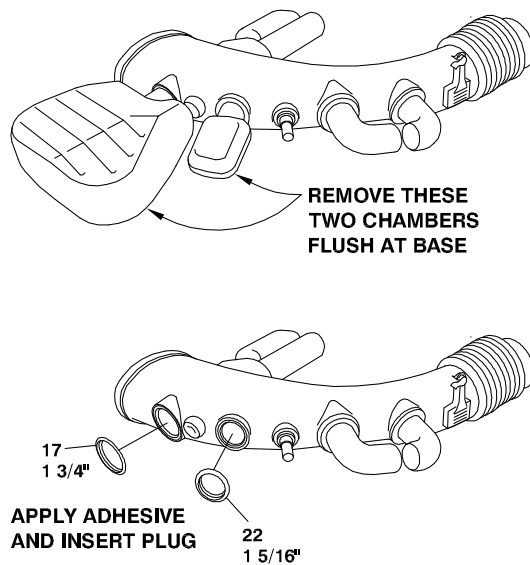
Clutch Pump Kit

700535

FIG. 3 5.4L AIRBOX MODIFICATION



6.8L AIRBOX MODIFICATION



DEWEZE Clutch Pump Kit 700535

Ford 5.4L, 6.8L, no A/C, 2008+, A P315 Pump

INSTALLATION INSTRUCTIONS

1. The installation of this kit requires trained decision-making concerning clearances, tying components together, rerouting, or relocating OEM components, etc. It is impossible to describe all of the clearance and vibration points, etc. in the installation instructions. Therefore, the technician must exercise professional judgment to achieve the best quality installation.
2. Disconnect the battery.
3. Loosen clamps at the end of the large plastic airbox and remove airbox.
4. Remove the OEM belt.
5. On 2009 and later trucks, remove the OEM bracket over the top of the alternator. On the passenger side of the alternator remove .75" from the bracket as in Fig. 4. On the driver's side of the alternator where the loop over the alternator meets the horizontal arc, bend the bracket up 40°. Reinstall this bracket. Place the bridge plate (19) on top of the alternator bracket (from Location D to Location E), using the OEM bolts (20, 21).
6. Remove OEM idler pulley (12) to gain access to mounting bolt at location B. Keep the pulley and bolt.
7. Remove nut (13) holding wire at location A. Remove stud bolt (6) at location A. Remove OEM bolt at location B.
8. Install the hose adapters into the pump ports. Bolt pump (3) onto pump plate (1) with two 3/8 x 1 1/4 bolts (9) with two 3/8 lock washers (28). Attach coil (4a) with four 1/4 x 1/2 flange bolts (4b). Torque these to 6 ft-lb. Attach clutch pulley (4c) to pump shaft with 5/16NF x 1 1/4 bolt (4d) and heavy washer (4e). Torque to 14 ft-lb.
9. Attach the idler pulley (5) to the boss on the front of the pump mount bracket (1) at Location C with the 3/8 x 2 bolt (8). Torque to 19-25 ft-lb.
10. See Fig. 5. Disconnect the wiring from the alternator, pull it from the attachment points on the valve cover and push it back on top of the valve cover. Make sure the alternator wiring will not be pinched between the engine and pump bracket when it is installed.

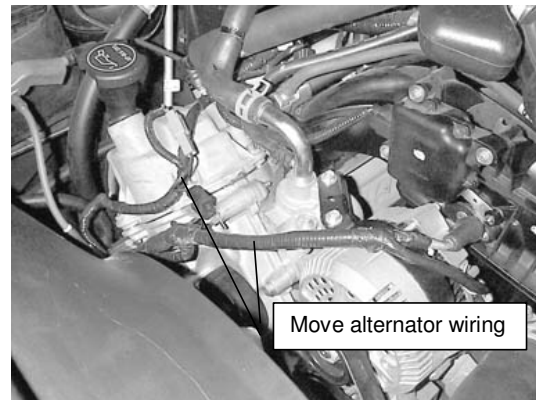


Fig. 5

11. Attach the pump mount bracket (1) to the engine with the OEM stud bolt (6) at Location A and the M8 x 60 (7) bolt at Location B. Torque these bolts to 19-25 ft-lb.
12. Reinstall OEM idler (12) using the OEM bolt in its original location. Torque to 19-25 ft-lb.
13. Install the serpentine pump drive belt (15) per diagram.

14. Replace the wire (14) on the stud bolt (6) rotating it 180 degrees from the OEM position so it points away from the pump bracket so it is not in the belt line. See Fig. 6.



Fig. 6

15. Set the airbox in place and check to see if it contacts the pump or bracket. If it does, it is necessary to remove part of the airbox for clearance.

On the **5.4L** engine airbox, the large chamber on the passenger end that interferes with the pump must be removed. Cut the web between the chambers and the main tube. Cut the chamber from the tube leaving about one inch of tube. Apply a heat-resistant adhesive to the tapered silicone plug (18) and insert completely into hole.

On the **6.8L** engine airbox, remove the two chambers flush at the base where they connect to main tube. Apply a heat-resistant adhesive to the recessed button plugs (17 and 22) and press firmly into their appropriate hole.

16. Replace the air box (16) and re-tighten the two clamps.
17. Connect the battery.
18. Run the engine and check for any clearance or alignment problems. Adjust as needed.

BOLT PACKAGES:		HYDRAULICS by Deweze		Clutch Pump Kit		700512	
Ford 6.2L: G, 2011-2013, A Pump, Side Port							
BRACKET	716053	(Inc. item 11-22)					
IDLER PULLEY	None						
CRANK PULLEY	None						
TENSIONER	None						
FAN SPACER	None						
		3-8-10		ISSUE DATE		C 9-4-13	
						REVISION DATE	

Item	Quan.	Part No.	Description
1.	1	716047	PUMP MOUNT BRACKET
2.	1	716048	IDLER BRACKET
3.	1	716049	BRACE, PUMP MOUNT
4.	1	716050	BUSHING, BRACE
5.	1	710936	PUMP PLATE
6.	1	740151	IDLER, FLAT
7.	1	740427	IDLER, 6-GROOVE
8.	1	110662	WASHER, 1/2 FLAT
9.	1	*	PUMP
10.	1	742016	CLUTCH, 6 GROOVE w/DIODE
11.	1	110775	BOLT, M8 X 1.25 X 60
12.	2	110569	BOLT, M8 X 1.25 X 65 LOWHEAD SOCKET
13.	3	110558	BOLT, M8 X 1.25 X 50 HEX HEAD
14.	2	110933	BOLT, M16 X 2.0 X 35 FLANGE 10.9
15.	1	110437	BOLT, 3/8-16 X 0.75 WIZ FLNG
16.	1	110435	BOLT, 3/8-16 X 1.5 HEX HEAD
17.	5	110703	WASHER, M8 FLAT
18.	1	110676	WASHER, 3/8 FLAT
19.	3	110465	BOLT, 3/8-16 X 1.25 SOCKET HEAD
20.	--	-----	-----
21.	2	110425	BOLT, 3/8-16 X 1.25 HEX HEAD
22.	2	110672	WASHER, 3/8 LOCK
23.	1	702111	AIR TUBE
24.	1	702112	REDUCER, AIR INTAKE
25.	1	702113	ELBOW, AIRBOX
26.	3	702114	CLAMP, 3.5"
27.	1	702115	CLAMP, 4"
28.	1	120088	HOSE SPLICE
29.	1	716052	HOSE, 1.5" ID X 2.25" LONG
30.	2	511002	CLAMP, HOSE #24 1.5"
31.	5	100578	CABLE TIE, 14"
32.	1	740283	BELT

FIG. 1
BELT DIAGRAM

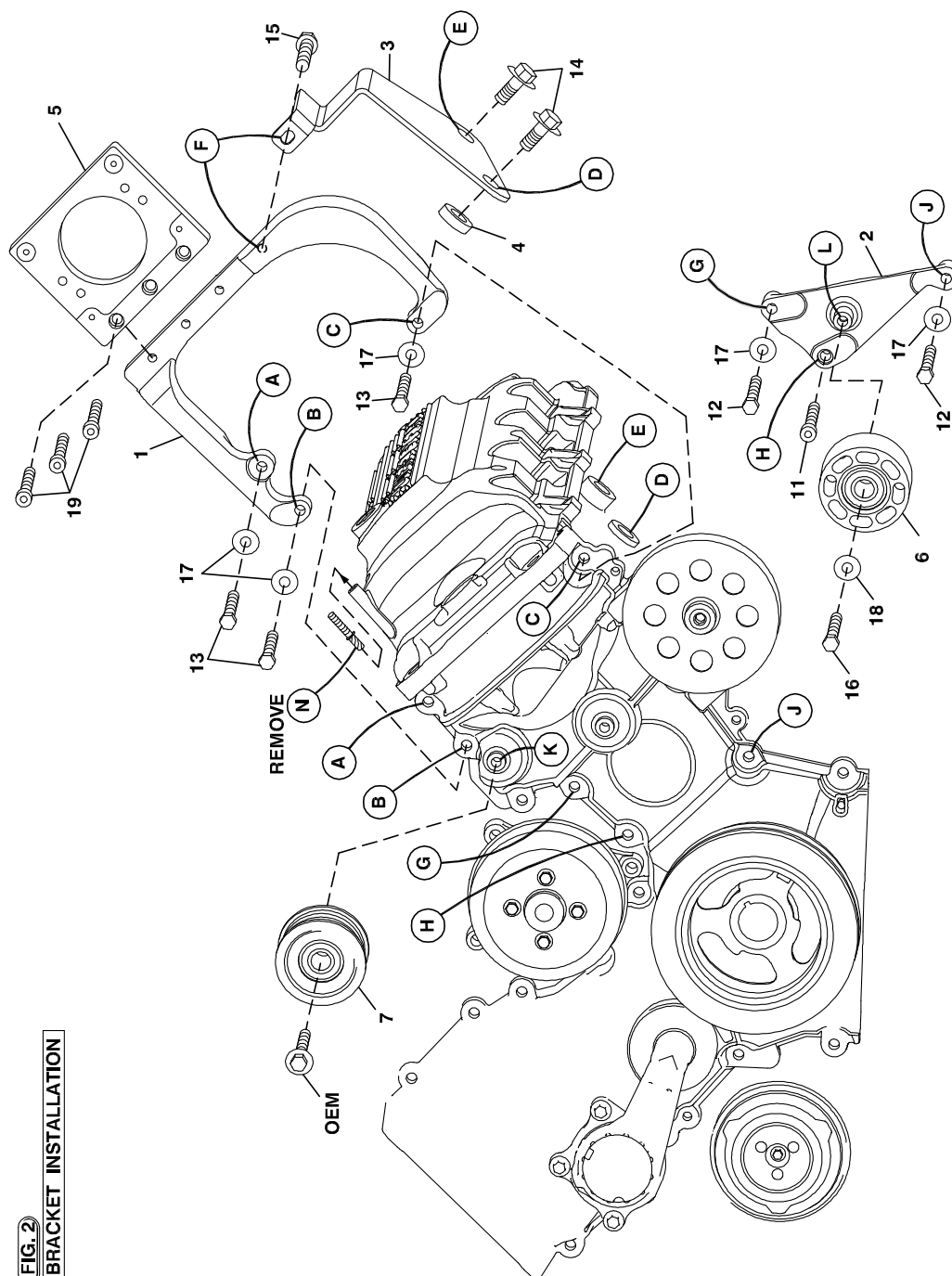
© HARPER INDUSTRIES, INC. 2010

309516 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2011

DeWeze

Clutch Pump Kit

700512





Clutch Pump Kit

700512

FIG. 3

BRACKET BRACE INSTALLATION

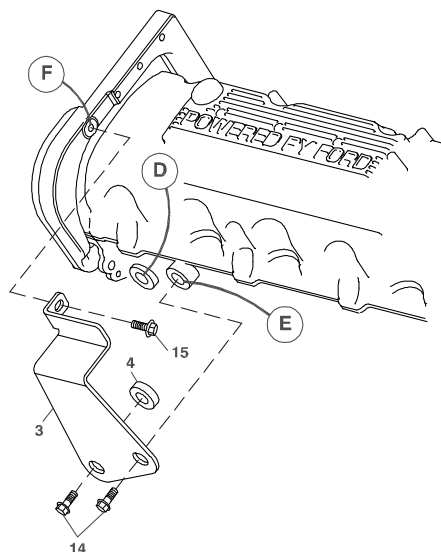


FIG. 7

VALVE COVER MODIFICATION FOR 2012+

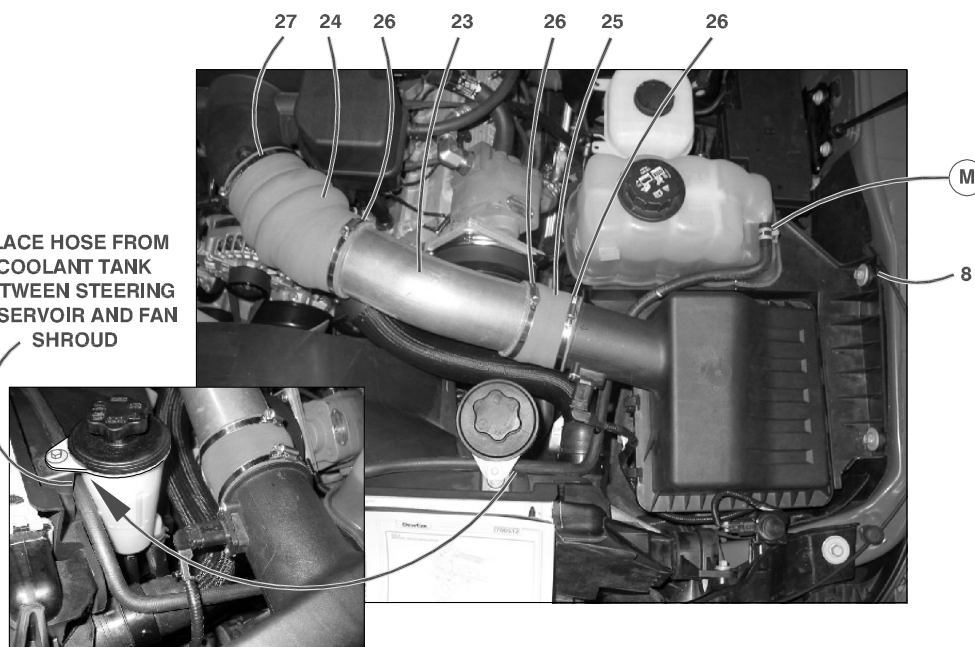


LOCATION P.
PULL CABLE CLAMP FROM
THIS HOLE. CUT OFF THIS TAB.

FIG. 4

AIR TUBE REPLACEMENT

PLACE HOSE FROM
COOLANT TANK
BETWEEN STEERING
RESERVOIR AND FAN
SHROUD



DewEze Clutch Pump Kit 700512

Ford 6.2L Gas, A Pump, Side Port, 2011 +

INSTALLATION INSTRUCTIONS

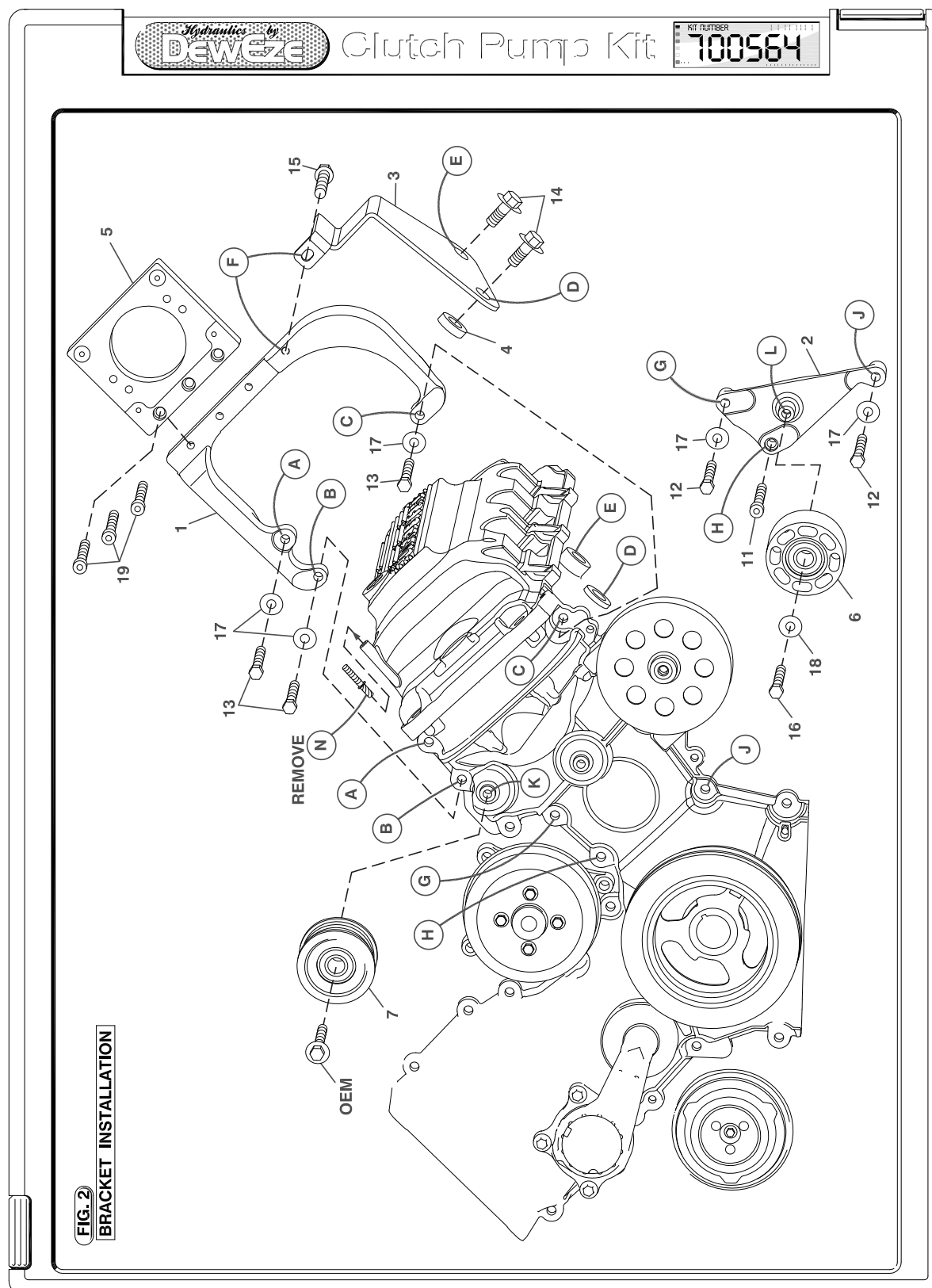
1. The installation of this kit requires trained decision-making concerning clearances, tying components together, rerouting, or relocating OEM components, etc. It is impossible to describe all of the clearance and vibration points, etc. in the installation instructions. Therefore, the technician must exercise professional judgment to achieve the best quality installation.
2. Disconnect the battery.
3. Remove the air tube connecting the air filter box to the intake box on top of the engine. Drain just enough of the engine coolant to remove the upper radiator hose from the engine water neck. Insert the hose splice (28) into the OEM radiator hose, push the short piece of radiator hose (29) onto the splice and onto engine with two 1.5" hose clamps (30). Unclamp the hose from the top front of the coolant tank (Location M), thread it between the power steering reservoir and the fan shroud and connect it back to the coolant tank. Replace coolant.
4. The supply hose for the power steering pump must be rotated to clear the new belt routing. Hold the spring clamp with locking pliers, and rotate the hose as far towards the driver side fender as possible. Using a cable tie (31), secure the steering hose to the radiator hose running between the coolant tank and the radiator. On 2012 and newer trucks, pull the wiring cable from the attachment point on the front of the driver's side valve cover at Location P, Fig. 7. Cut off that tab from the cover to give clearance for the belt.
5. Remove the rear bolt from the airbox attached to the fender and place the 1/2" heavy washer (8) between the airbox and the fender to angle the outlet tube forward. Reinstall the OEM bolt.
6. Remove the three bolts on the lower portion of engine at Locations G, H, and J. Install the idler bracket (2) with two M8 x 65 hex head bolts (12) and two M8 flat washers (17) at Locations G and J. Insert the M8 x 60 low head socket head bolt (11) at Location H. Install the flat idler (6) with 3/8 x 1 1/2 bolt (16) and 3/8 flat washer (18) at Location L.
7. Install the pump bracket brace (3) to the two large threaded holes on the side of the cylinder head at Locations D and E, placing the bushing (4) between the front hole and the bracket using M16 x 35 flange bolts (14). Do not completely tighten.
8. Remove the OEM flat idler at Location K. Remove the OEM stud bolt holding the wiring clip at Location N. Let the wiring rest below the pump. Remove the three bolts at locations A, B, and C. Install the pump bracket (1) with three M8 x 50 hex bolts (13) and three M8 flat washers (17). Fasten brace to pump bracket with 3/8 x 3/4 flange head bolt (15) through brace into back of pump bracket. Tighten all the bolts on the brace. Install the 6-groove idler (7) at Location K with the OEM bolt.
9. Mount the pump (10) to the back of the pump plate (5) with two 3/8 x 1 1/4 bolts (21) and two 3/8 flat washers (22). Install fittings to pump, then install pump plate with three 3/8 x 1.25 socket head bolts. Mount the clutch coil (10a) to the pump bracket with four 1/4 x 1/2 flange bolts (10b). Mount the clutch pulley (10c) to the pump shaft with the 5/16 x 1 1/4 bolt (10d) and heavy flat washer (10e) making sure the key is in place on the shaft.
10. Install belt (32) according to diagram.
11. Place elbow (25) onto airbox with 3.5" clamp (26). Insert DewEze air tube (23) into elbow using a 3.5" clamp (26). Place 3.5" end of reducer onto air tube using 3.5" clamp (26), also pushing 4" end onto air intake using the 4" clamp (27). Make sure there is clearance between the air tube and the clutch. Adjust the air tube and elbow by twisting them if needed.
12. Reconnect the battery.
13. Run the engine and check for any clearance or alignment problems. Adjust as needed.

BOLT PACKAGES:		Clutch Pump Kit KIT NUMBER 700564	
Ford 6.2L: G, 2014+, A Pump, Side Port			
BRACKET	716053 (Inc. Item 4, 8, 11-19)	702116	BELT DIAGRAM
RESONATOR	716188 (Inc. Item 35, 36)		
IDLER PULLEY	None		
CRANK PULLEY	None		
TENSIONER	None	8-30-13	ISSUE DATE : NC 8-30-13
			REVISION DATE

Item	Quan.	Part No.	Description
1.	1	716047	PUMP MOUNT BRACKET
2.	1	716048	IDLER BRACKET
3.	1	716049	BRACE, PUMP MOUNT
4.	1	716050	BUSHING, BRACE
5.	1	710936	PUMP PLATE
6.	1	740151	IDLER, FLAT
7.	1	740427	IDLER, 6-GROOVE
8.	1	110662	WASHER, 1/2 FLAT
9.	1	*	PUMP
10.	1	742016	CLUTCH, 6 GROOVE w/DIODE
11.	1	110775	BOLT, M8 X 1.25 X 60 LOWHEAD SOCKET
12.	2	110569	BOLT, M8 X 1.25 X 65 HEX HEAD
13.	3	110558	BOLT, M8 X 1.25 X 50 HEX HEAD
14.	2	110933	BOLT, M16 X 2.0 X 35 FLANGE 10.9
15.	1	110437	BOLT, 3/8-16 X 0.75 WIZ FLNG
16.	1	110435	BOLT, 3/8-16 X 1.5 HEX HEAD
17.	5	110703	WASHER, M8 FLAT
18.	1	110676	WASHER, 3/8 FLAT
19.	3	110465	BOLT, 3/8-16 X 1.25 SOCKET HEAD
20.	-	-	-
21.	2	110425	BOLT, 3/8-16 X 1.25 HEX HEAD
22.	2	110672	WASHER, 3/8 LOCK
23.	1	702111	AIR TUBE
24.	1	702112	REDUCER, AIR INTAKE
25.	1	702113	ELBOW, AIRBOX
26.	3	702114	CLAMP, 3.5"
27.	1	702115	CLAMP, 4"
28.	1	120088	HOSE SPLICE
29.	1	716052	HOSE, 1.5" ID X 2.25" LONG
30.	2	511002	CLAMP, HOSE #24 1.5"
31.	5	100578	CABLE TIE, 14"
32.	1	740283	BELT
33.	1	702143	RESONATOR
34.	1	702144	BRACKET, ALT/RES.
35.	2	110932	M6 X 1.0 X 30 BOLT
36.	2	111033	1/4 X 1 FLAT WASHER

FIG. 1
BELT DIAGRAM

309993 DEWEZE PUMP KIT W/ CLUTCH F350 V8, GAS 2014





Clutch Pump Kit



FIG. 3

BRACKET BRACE INSTALLATION

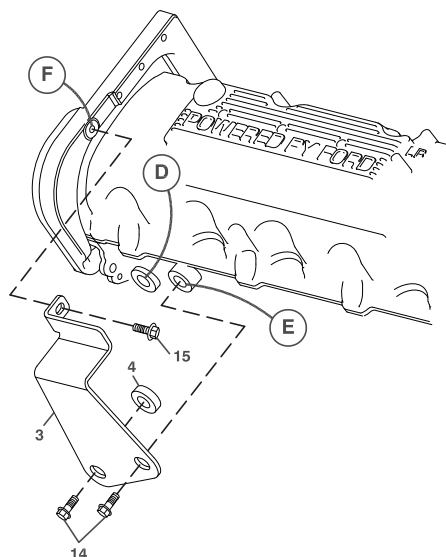


FIG. 7

VALVE COVER MODIFICATION FOR 2012+

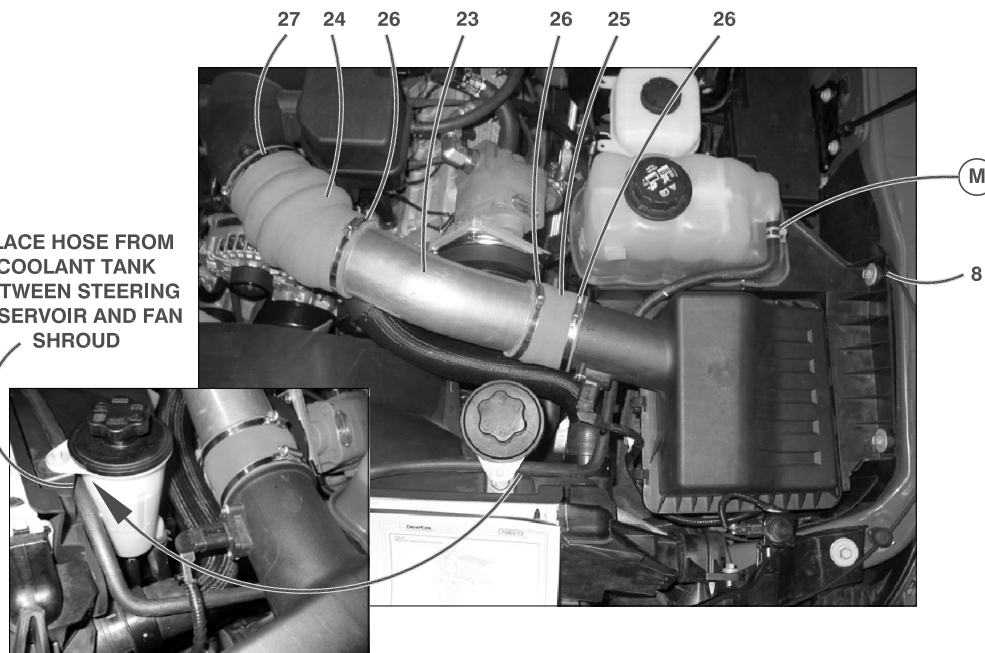


LOCATION P.
PULL CABLE CLAMP FROM
THIS HOLE. CUT OFF THIS TAB.

FIG. 4

AIR TUBE REPLACEMENT

PLACE HOSE FROM
COOLANT TANK
BETWEEN STEERING
RESERVOIR AND FAN
SHROUD





Clutch Pump Kit

KIT NUMBER
700564

FIG. 5
BRACKET LOCATION
RADIATOR HOSE SPLICE

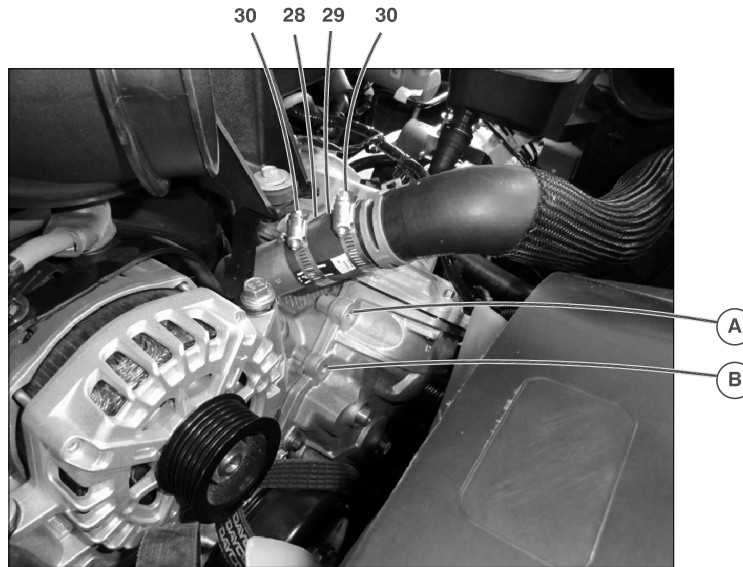
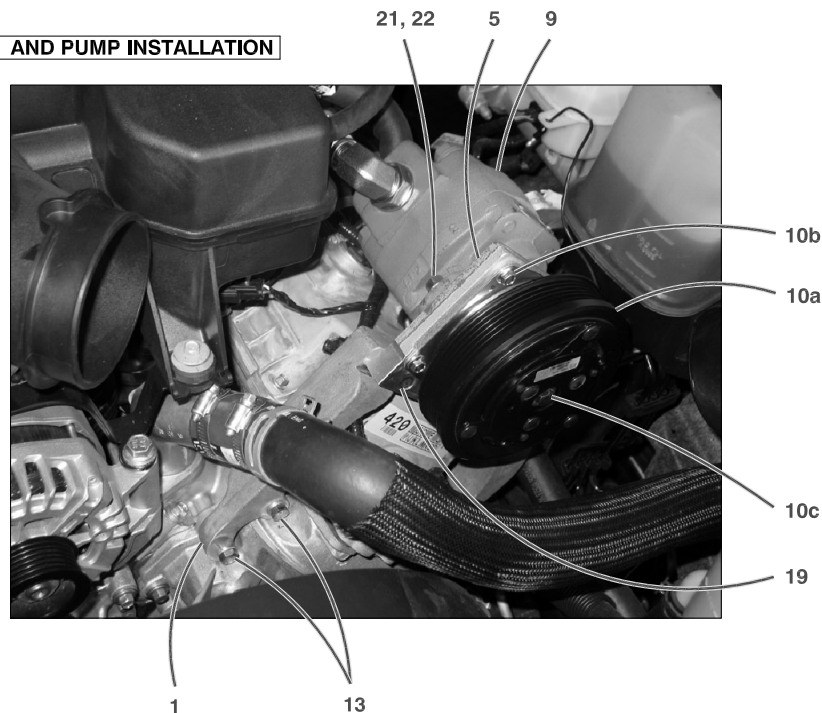
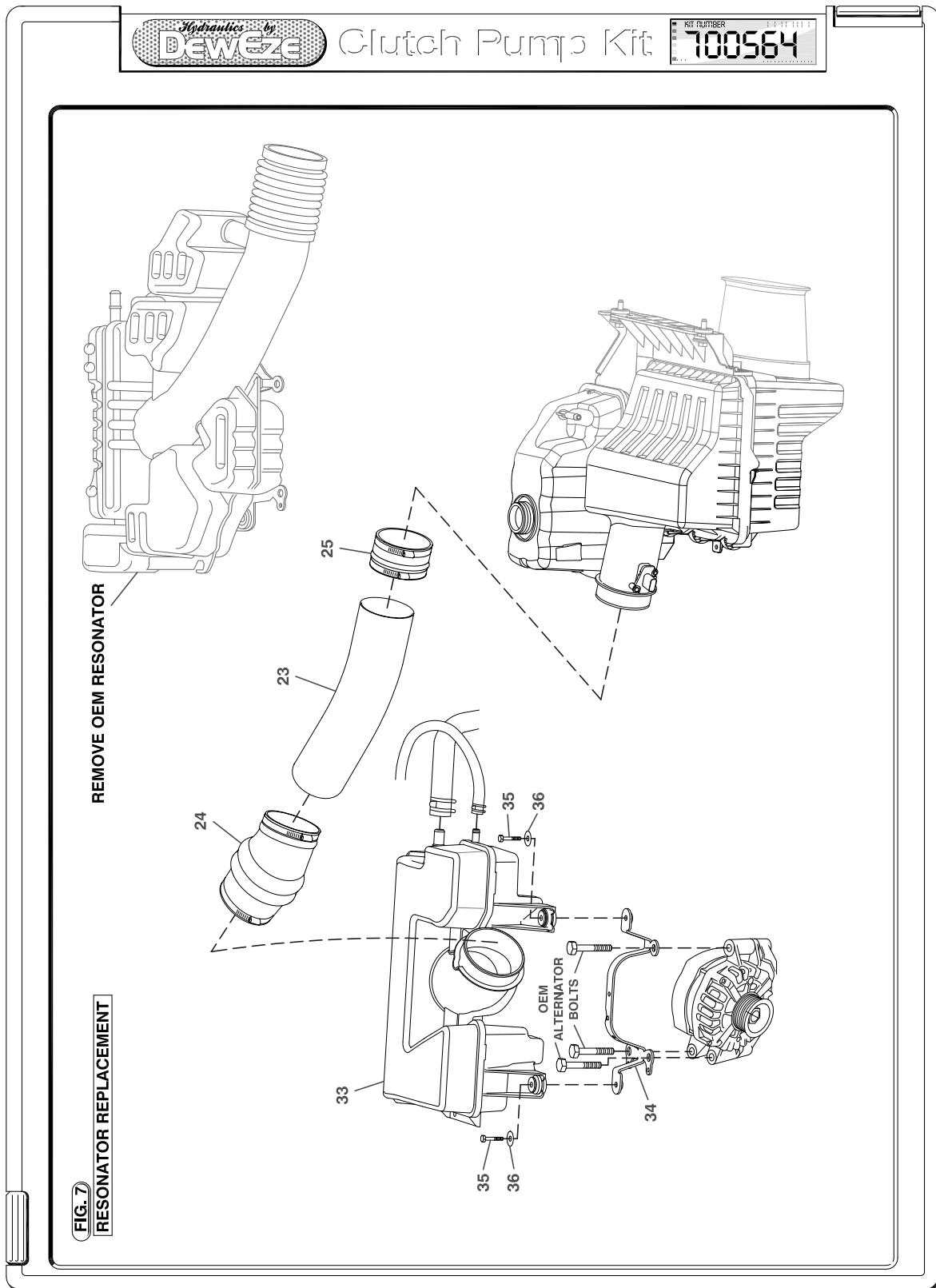


FIG. 6
BRACKET AND PUMP INSTALLATION





DewEze Clutch Pump Kit 700564

Ford 6.2L Gas, A Pump, Side Port, 2014+

INSTALLATION INSTRUCTIONS

1. The installation of this kit requires trained decision-making concerning clearances, tying components together, rerouting, or relocating OEM components, etc. It is impossible to describe all of the clearance and vibration points, etc. in the installation instructions. Therefore, the technician must exercise professional judgment to achieve the best quality installation.
2. Disconnect the battery. Remove the belt.
3. Remove the two bolts mounting the resonator. Remove the resonator/air tube. Remove three alternator mounting bolts and remove the resonator mounting bracket (34). Install the new resonator bracket (34) with the OEM alternator bolts. Install the new resonator (33) using two M6 x 30 bolts (35) with two 1/4 flat washers (36).
4. Drain just enough of the engine coolant to remove the upper radiator hose from the engine water neck. Insert the hose splice (28) into the OEM radiator hose, push the short piece of radiator hose (29) onto the splice and onto engine with two 1.5" hose clamps (30). Unclamp the hose from the top front of the coolant tank (Location M), thread it between the power steering reservoir and the fan shroud and connect it back to the coolant tank. Replace coolant.
5. The supply hose for the power steering pump must be rotated to clear the new belt routing. Hold the spring clamp with locking pliers, and rotate the hose as far towards the driver side fender as possible. Using a cable tie (31), secure the steering hose to the radiator hose running between the coolant tank and the radiator. On 2012 and newer trucks, pull the wiring cable from the attachment point on the front of the driver's side valve cover at Location P, Fig. 7. Cut off that tab from the cover to give clearance for the belt.
6. Remove the rear bolt from the airbox attached to the fender and place the 1/2" heavy washer (8) between the airbox and the fender to angle the outlet tube forward. Reinstall the OEM bolt.
7. Remove the three bolts on the lower portion of engine at Locations G, H, and J. Install the idler bracket (2) with two M8 x 65 hex head bolts (12) and two M8 flat washers (17) at Locations G and J. Insert the M8 x 60 low head socket head bolt (11) at Location H. Install the flat idler (6) with 3/8 x 1 1/2 bolt (16) and 3/8 flat washer (18) at Location L.
8. Install the pump bracket brace (3) to the two large threaded holes on the side of the cylinder head at Locations D and E, placing the bushing (4) between the front hole and the bracket using M16 x 35 flange bolts (14). Do not completely tighten.
9. Remove the OEM flat idler at Location K. Remove the OEM stud bolt holding the wiring clip at Location N. Let the wiring rest below the pump. Remove the three bolts at locations A, B, and C. Install the pump bracket (1) with three M8 x 50 hex bolts (13) and three M8 flat washers (17). Fasten brace to pump bracket with 3/8 x 3/4 flange head bolt (15) through brace into back of pump bracket. Tighten all the bolts on the brace. Install the 6-groove idler (7) at Location K with the OEM bolt.
10. Mount the pump (10) to the back of the pump plate (5) with two 3/8 x 1 1/4 bolts (21) and two 3/8 flat washers (22). Install fittings to pump, then install pump plate with three 3/8 x 1.25 socket head bolts. Mount the clutch coil (10a) to the pump bracket with four 1/4 x 1/2 flange bolts (10b). Mount the clutch pulley (10c) to the pump shaft with the 5/16 x 1 1/4 bolt (10d) and heavy flat washer (10e) making sure the key is in place on the shaft.
11. Install belt (32) according to diagram.
12. Place elbow (25) onto airbox with 3.5" clamp (26). Insert DewEze air tube (23) into elbow using a 3.5" clamp (26). Place 3.5" end of reducer onto air tube using 3.5" clamp (26), also pushing 4" end onto air intake using the 4" clamp (27). Make sure there is clearance between the air tube and the clutch. Adjust the air tube and elbow by twisting them if needed.
13. Reconnect the battery.
14. Run the engine and check for any clearance or alignment problems. Adjust as needed.

Deweze

Clutch Pump Kit

700421

Bracket Assy.	None
Bolt Packages:	
Bracket	711584 (Inc. items 7, 12, 13, 16)
Pulley	None
Idler	None
Tensioner	None

Make	Ford
Engine	6.0L
Fuel	Diesel
Year	2003-
Equipment	Turbo, w/ and w/o A/C
Revised	F 4-3-06

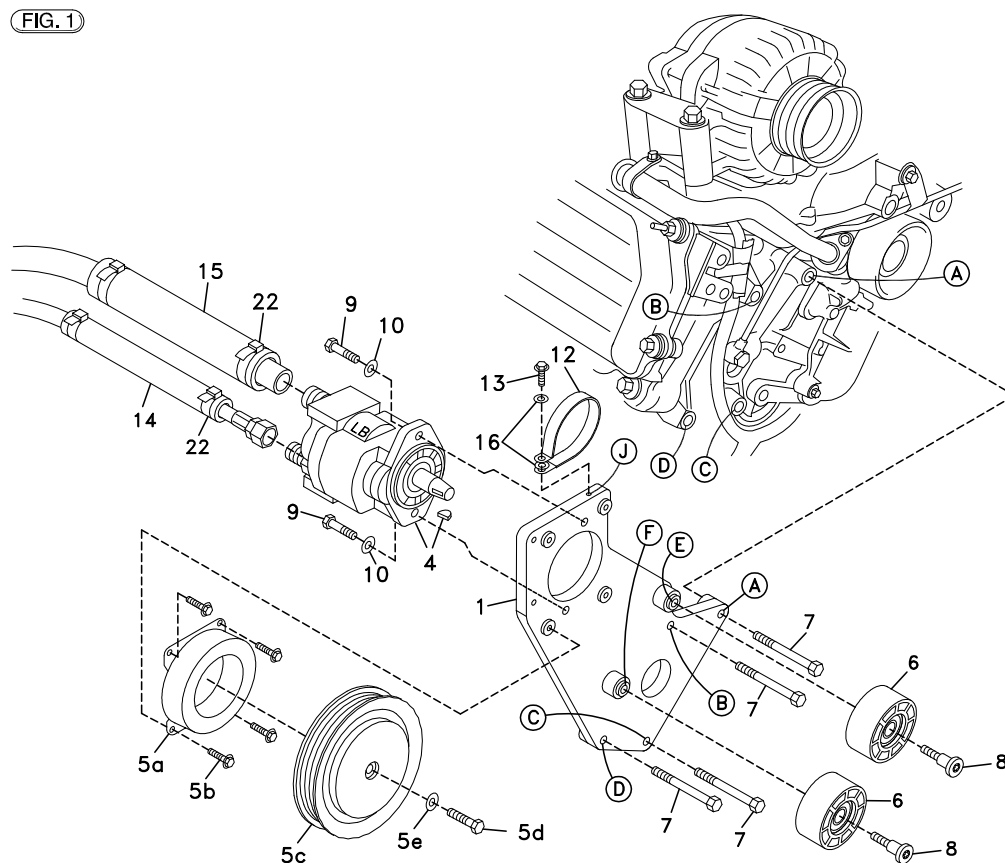
Item	Part No.	Description
1.	711575	Pump mount bracket
2.	-----	-----
3.	700272	Intercooler tube
4.	*	Pump
5.	742009	Clutch
6.	740261	Idler pulley
7.	110488	M10 x 45 x 1.5 Bolt
8.	110213	M10 x 40 Torx head shoulder bolt
9.	110425	3/8-16 x 1 1/4 Bolt
10.	110676	3/8 Flat washer
11.	-----	-----
12.	102024	Vinyl clamp, 2 1/2"
13.	710586	1/4 x 1 Self tap screw
14.	**	Insulation, pressure hose
15.	**	Insulation, suction hose
16.	110673	1/4 Flat washer
17.	740360	Belt, Poly-Cog 1490K8
18.	-----	-----
19.	-----	-----
20.	-----	-----
21.	-----	-----
22.	100578	Cable tie

* See master list for pump part number

** Hose sizes depend on the pump size. Hose insulation diameter depends on the hose size.

The smaller diameter insulation goes on the pressure hose, and the larger diameter insulation goes on the suction hose.

FIG. 1



(A),(B),(C)... Denotes bolt holes in engine to locate corresponding holes in Pump Brkt.

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307377 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2003

Deweze

Clutch Pump Kit 700421

FIG. 2

COMPONENT PLACEMENT AND MODIFICATION

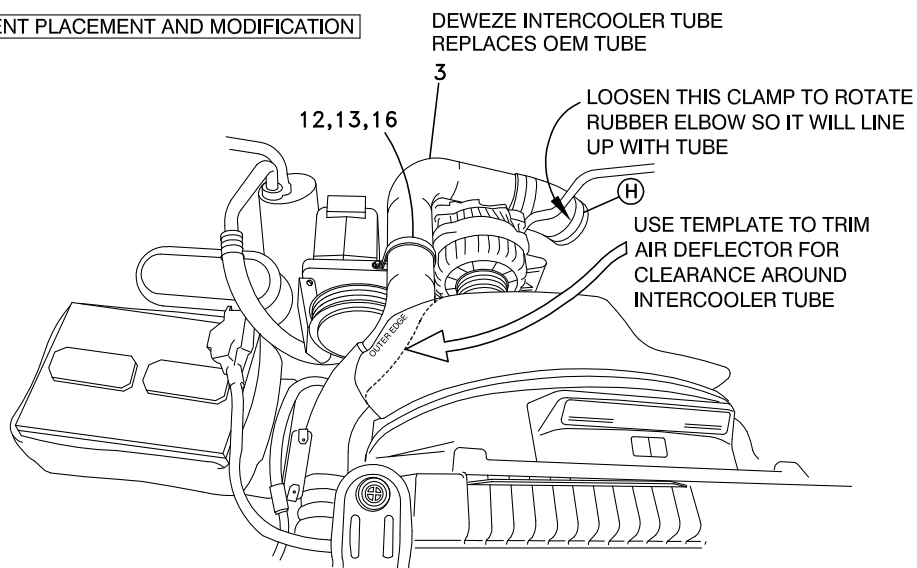
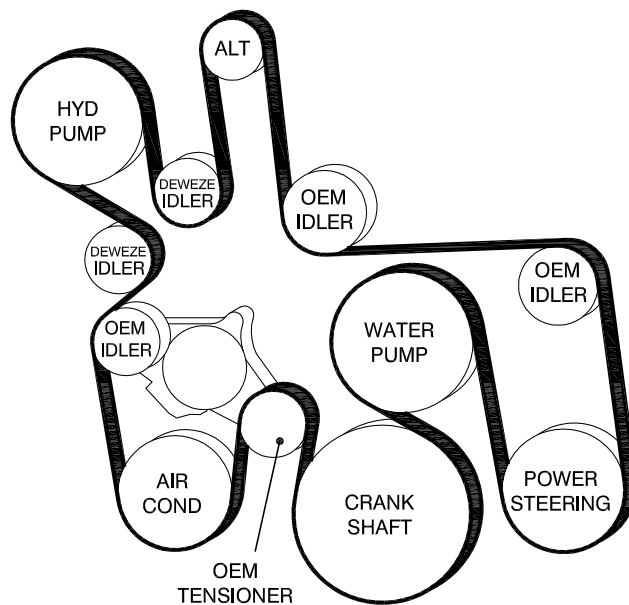


FIG. 3

BELT DIAGRAM



DewEze

Clutch Pump Kit

Clutch Pump Kit

700421

Ford 6.0

Diesel

With A/C

2003-

INSTALLATION INSTRUCTIONS

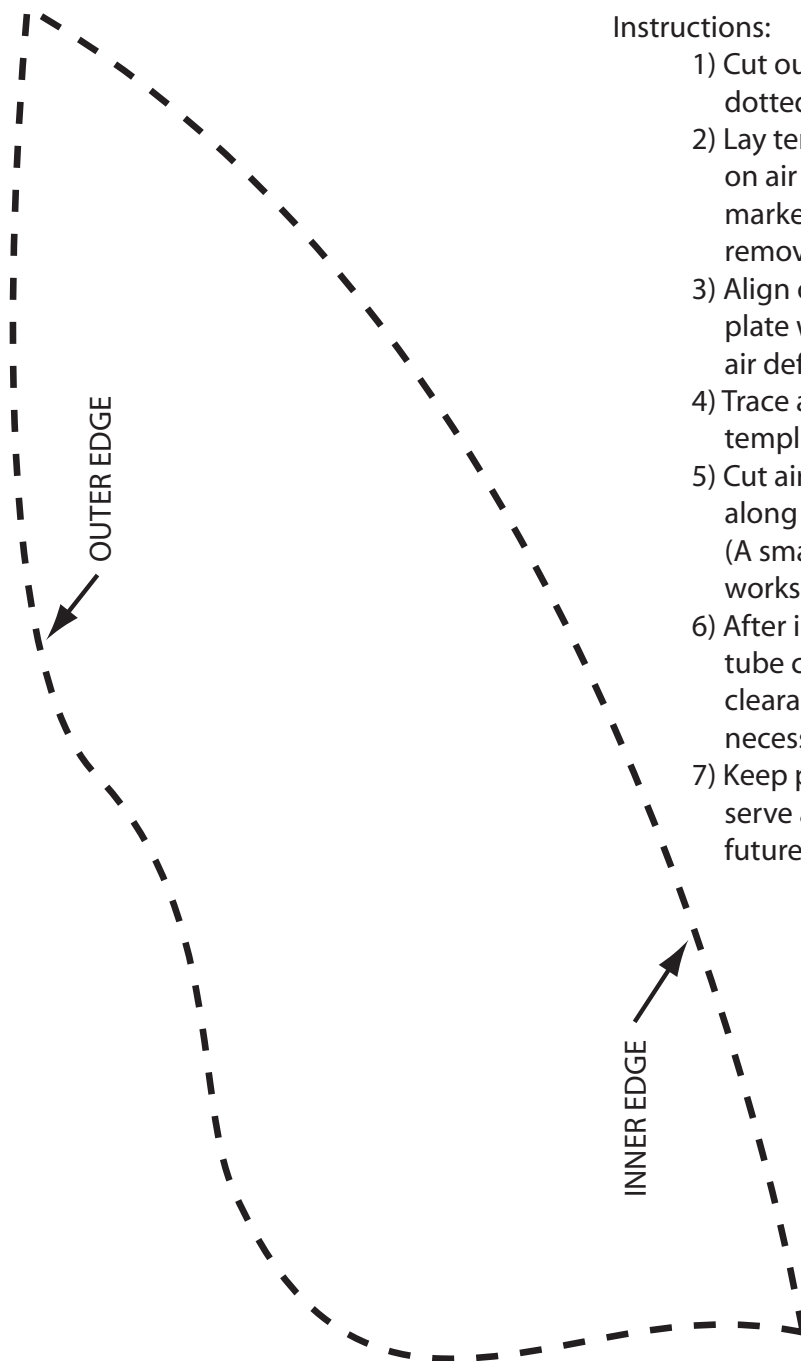
1. Disconnect the battery.
2. Remove the air deflector shield from the top of the fan shroud.
3. Remove the OEM intercooler tube.
4. Remove the OEM belt. The tensioner has a spring to lock it open without any tension. Remove two bolts mounting the tensioner. Just let it lay against the shroud to allow room to mount the pump bracket.
5. Slip the small hose insulation sheath (14) over the pressure hose. Slip the large hose insulation sheath (15) over the suction hose. Place the sheaths where the hoses run close to the exhaust to protect the hoses from the heat. Fasten the sheaths to the hoses with the nylon cable ties (22). Route the hoses back to the firewall and down running them outside the frame.
6. Mount pump (4) onto bracket (1) with the two 3/8 x 1 1/4 bolts (9) with two 3/8 flat washers (10). Install the adapters into the inlet and outlet ports in back of the pump. Mount the clutch coil (5a) to the pump bracket with four 1/4 x 1/2 flange bolts (5b). Mount the clutch pulley (5c) to the pump shaft with the 5/16 x 1 1/4 bolt (5d) and heavy flat washer (5e) making sure the key is in place on the shaft.
7. Mount the bracket onto the engine with the four M10 x 45 bolts (7). Reattach OEM tensioner with the OEM bolts.
8. Mount the two idler pulleys (6) to the bosses on the pump bracket at Locations E and F with the M10 x 40 Torx® head shoulder bolts (8).
9. Install the belt (17) as shown in the diagram (Fig. 3). Release the lock on the tensioner to tighten the belt.
10. The deflector shield will need to be trimmed for clearance around the intercooler tube. See the separate template sheet included with the instructions (Fig. 4). Snap the shield into place making sure it does not make contact. See Fig. 2.
11. Install the DewEze intercooler tube (3) into the same location as the OEM tube was. It may be necessary to loosen the hose clamp on the rubber elbow on the turbo (Location H) so the elbow can be rotated to line up with the intercooler tube. Place the 2 1/2" clamp (12) around the intercooler tube. Insert one 1/4" flat washer (16) between the upper and lower tabs of the clamp and one washer on top. Secure the clamp with the 1/4" self-tapping screw (13) into the pump bracket at Location J. Tighten the OEM hose clamps.
12. Connect the hoses to the pump.
13. Reconnect the battery.
14. Run the engine and check for any clearance or alignment problems. Adjust as needed.

Deweze

Clutch Pump Kit

700421

(FIG. 4) TEMPLATE - FOR REMOVING CORNER OF AIR DEFLECTOR SHIELD
ON A FORD 6.0L DIESEL



Instructions:

- 1) Cut out template along dotted lines.
- 2) Lay template over area on air deflector shield marked in Figure 2 for removal.
- 3) Align outer edge of template with outer edge of air deflector shield.
- 4) Trace along inner edge of template with a marker.
- 5) Cut air deflector shield along the traced line. (A small cut-off wheel works well.)
- 6) After installing intercooler tube check for adequate clearance. Trim further if necessary.
- 7) Keep plastic cut-out to serve as a template on future installs.

Clutch Pump Kit 700532																						
Ford 6.4L : D, 2008-10, A, PH 14 Pump, 9 GPM Max.																						
Bolt Packages: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Bracket</td> <td>711866 (Inc. item 4)</td> </tr> <tr> <td>Idler</td> <td>None</td> </tr> <tr> <td>Crank pulley</td> <td>None</td> </tr> <tr> <td>Tensioner</td> <td>None</td> </tr> </table>	Bracket	711866 (Inc. item 4)	Idler	None	Crank pulley	None	Tensioner	None	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Bracket Assy.</td> <td>None</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>Issue Date</td> <td>5-27-11</td> </tr> <tr> <td>Revision Date</td> <td>NC 5-27-11</td> </tr> </table>	Bracket Assy.	None					Issue Date	5-27-11	Revision Date	NC 5-27-11			
Bracket	711866 (Inc. item 4)																					
Idler	None																					
Crank pulley	None																					
Tensioner	None																					
Bracket Assy.	None																					
Issue Date	5-27-11																					
Revision Date	NC 5-27-11																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">Item</th> <th style="width: 15%;">Part No.</th> <th style="width: 80%;">Description</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>711858</td> <td>Engine bracket</td> </tr> <tr> <td>2.</td> <td>*</td> <td>Pump / Side port</td> </tr> <tr> <td>3.</td> <td>742009</td> <td>Clutch</td> </tr> <tr> <td>4.</td> <td>110526</td> <td>M10 x 1.5 x 40 Bolt</td> </tr> <tr> <td>5.</td> <td>110440</td> <td>3/8-16 x 1 Flange head bolt</td> </tr> <tr> <td>6.</td> <td>742053</td> <td>Belt, Micro-V K081045</td> </tr> </tbody> </table>	Item	Part No.	Description	1.	711858	Engine bracket	2.	*	Pump / Side port	3.	742009	Clutch	4.	110526	M10 x 1.5 x 40 Bolt	5.	110440	3/8-16 x 1 Flange head bolt	6.	742053	Belt, Micro-V K081045	FIG. 1 BELT DIAGRAM
Item	Part No.	Description																				
1.	711858	Engine bracket																				
2.	*	Pump / Side port																				
3.	742009	Clutch																				
4.	110526	M10 x 1.5 x 40 Bolt																				
5.	110440	3/8-16 x 1 Flange head bolt																				
6.	742053	Belt, Micro-V K081045																				
FIG. 2 BRACKET INSTALLATION																						
(A),(B),(C)... Denotes bolt holes in engine to locate corresponding holes in Pump Brkt. © CHAPER INDUSTRIES, INC. 2011																						

308713 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2008

DEWEZE Clutch Pump Kit 700532

Ford 6.4L, 2008-10, A, PH14 Pump, 9 GPM Max

INSTALLATION INSTRUCTIONS

1. The installation of this kit requires trained decision-making concerning clearances, tying components together, rerouting, or relocating OEM components, etc. It is impossible to describe all of the clearance and vibration points, etc. in the installation instructions. Therefore, the technician must exercise professional judgment to achieve the best quality installation.
2. Disconnect the battery.
3. Remove air filter. Disconnect wires from airbox. Loosen clamp and remove the airbox.
4. Loosen the clamps on the intercooler tube, and pull the ends of the tube out from the rubber transition.
5. Remove the OEM belt.
6. Install the hose adapters into the pump ports. Bolt pump (2) onto pump plate (1) with two 3/8 x 1 bolts (5). Attach coil (3a) with four 1/4 x 1/2 flange bolts (3b). Torque these to 6 ft-lb. Attach clutch pulley (3c) to pump shaft with 5/16NF x 1 1/4 bolt (3d) and heavy washer (3e). Torque to 14 ft-lb.
7. Bolt the pump bracket (1) to the alternator bracket with three M10 x 40 bolts (4) at Locations A, B, and C.
8. Connect the hoses to the pump.
9. Install the belt (6) as shown in the belt diagram (Fig. 1).
10. Replace the air box and air filter. Reconnect the wires. Replace the intercooler tube and tighten the clamps.
11. Connect the battery.
12. Run the engine and check for any clearance or alignment problems. Adjust as needed.

Helpful Hint:

The upper portion of the fan shroud may be removed for easier access to the belt. Be careful with shroud as plastic is brittle.

Tightening Instructions for 37° (JIC) Flared Fittings

1. Sealing surface should be smooth and clean. Lubricate the threads and the entire surface of the cone with hydraulic fluid or a light lubricant.
2. Line up the two fittings and turn flare nut by hand until sealing surfaces contact.
3. Torque nut to these values:

Dash size -16.....85 to 113 foot/lbs.

-20....115 to 133 foot/lbs.

If a wrench pad is provided next to nut, place a second wrench on pad to prevent flare from rotating while being torqued.

Alternate Assembly Method

1. If torque wrench is not used, follow steps 1 and 2 above, then proceed with the following steps.
2. Turn the nut with a wrench until there is firm resistance.
3. Place a wrench on wrench pad next to nut near the 6 o'clock position.
4. Place a second wrench on nut near the 3 o'clock position.
5. Turn nut clockwise to no less than the 4 o'clock position and no more than the 6 o'clock position.

Why Surfaces To Be Torqued Should Be Lubricated

Lubrication produces a more consistent coefficient of friction and it increases clamping force on sealing area with less torque on the threads. Over tightening causes threads to deform and lose their ability to maintain an adequate load or clamping force on the seating area. Extended operation and severe conditions causes further deforming which promotes the possibility of leaks. Improper installation is the greatest cause for leaks.

HYDRAULICS by
DEWEZE

Clutch Pump Kit

700539

Ford 6.7L: D, Single Alternator, 2012+, A Pump, Side Port

BOLT PACKAGES:

BRACKET	716043 (Inc. Item 2, 4-9, 15)
IDLER PULLEY	None
CRANK PULLEY	None
TENSIONER	None
FAN SPACER	None

3-8-10	ISSUE DATE	A	11-21-11	REVISION DATE
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Item	Part No.	Description
1.	716038	Pump plate
2.	716040	Stator bushing
3.	716041	Stator offset clip
4.	110141	M8 x 1.25 Flange nut
5.	110270	M8 x 1.25 x 130 Hex head bolt
6.	110927	M8 x 1.25 x 120 Socket head bolt
7.	110928	M8 x 1.25 x 140 Hex head bolt
8.	110929	M8 x 1.25 x 20 Flange head bolt
9.	110930	M8 x 1.25 x 25 Flange button socket head bolt
10.	*	Pump, side port
11.	742009	Clutch
12.	OEM	Idler
13.	OEM	Bolt
14.	OEM	Stator
15.	110703	M8 Flat washer
16.	110440	3/8-16 x 1 Flange head bolt
17.	742093	Belt, Poly Cog 5081254

FIG. 1
BELT DIAGRAM

FIG. 2
REMOVE AIR BOX

309634 DEWEZE PUMP KIT W/ CLUTCH F350 V8, DSL 2012

DEWEZE

Clutch Pump Kit

700539

FIG. 3

BRACKET INSTALLATION

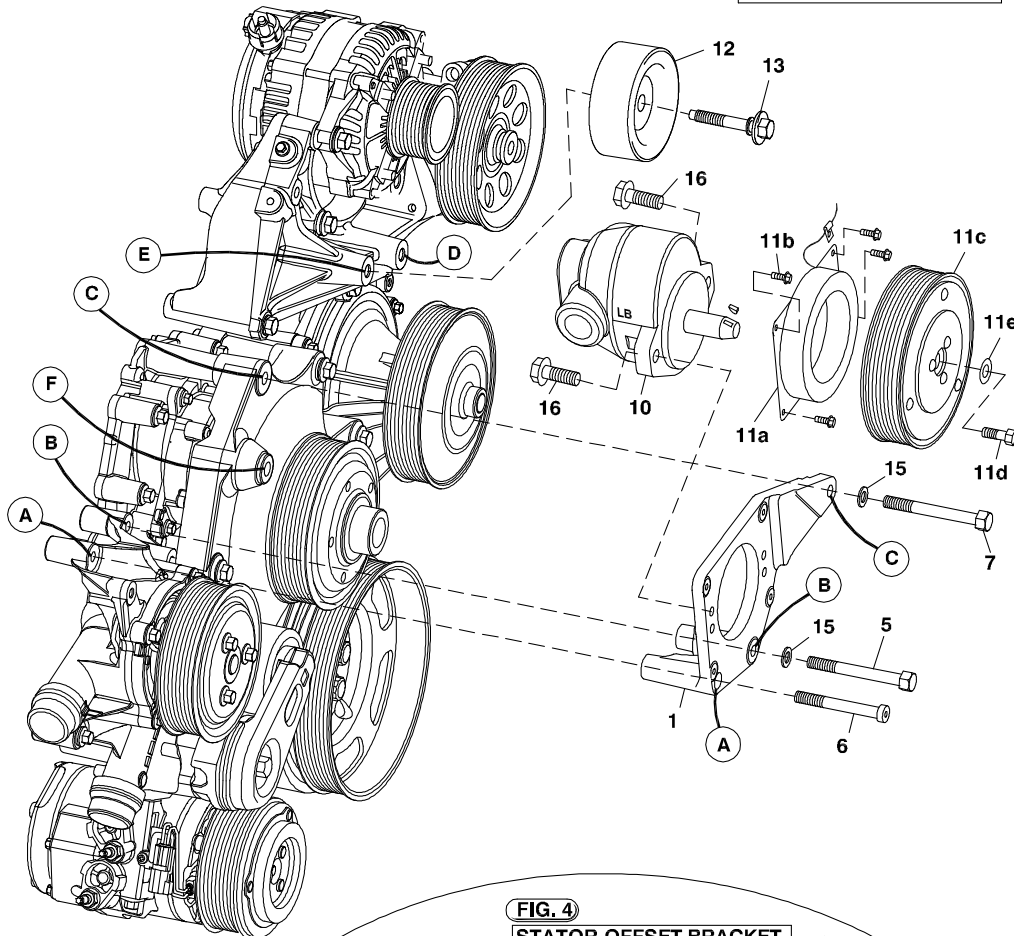
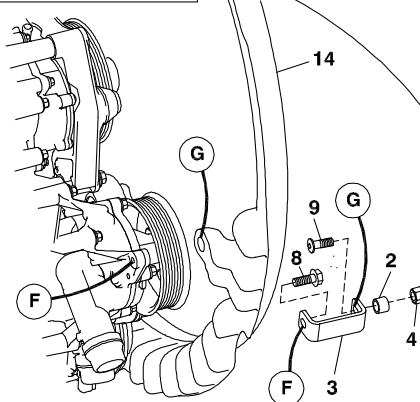


FIG. 4

STATOR OFFSET BRACKET

REMOVE OEM
SPACER.
REPLACE WITH
BRACKET 3.

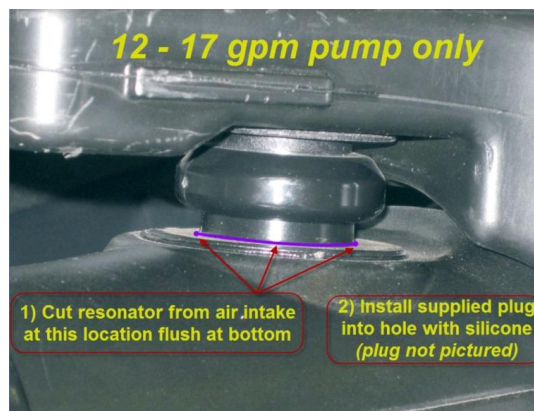
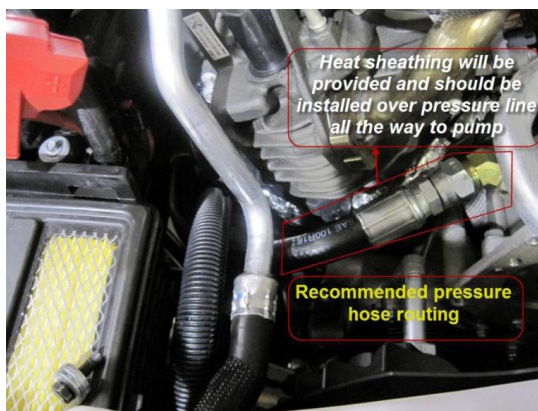
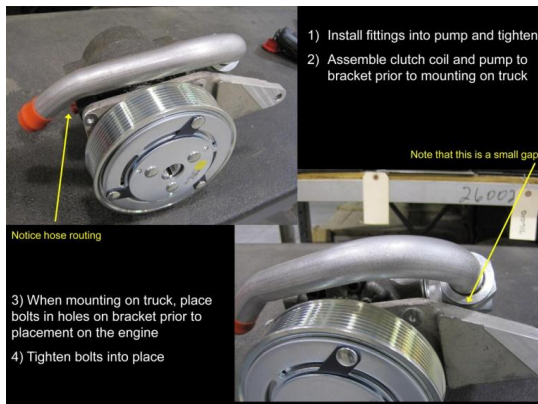


DEWEZE Clutch Pump Kit 700539

Ford 6.7L, Single Alt., A Pump, 2012+

INSTALLATION INSTRUCTIONS

1. The installation of this kit requires trained decision-making concerning clearances, tying components together, rerouting, or relocating OEM components, etc. It is impossible to describe all of the clearance and vibration points, etc. in the installation instructions. Therefore, the technician must exercise professional judgment to achieve the best quality installation.
2. Disconnect the battery.
3. Open all clips to the air cleaner lid and loosen clamp on the air inlet of engine. Remove the entire air intake tube and air cleaner lid as an assembly.
4. Unbolt the clamp holding the fan wiring harness and disconnect the plug. Remove the OEM engine belt. Remove the OEM idler pulley from the truck at Location F. Move the OEM idler from Location D to E. Install the new belt (17). Replace the fan wiring harness clamp and connect the plug.
5. Remove bolts at locations A, B and C. Remove the Stator bushing shown in Fig. 4. There is a 13mm nut on the front side of the stator tab. To remove the OEM spacer it will be helpful to also remove the nut on the stator spacer on the upper driver side of engine to allow the stator to move forward slightly.
6. Insert stator bushing (2) into large hole in rear of stator at Location G. Insert the stator offset clip (3) between points F and G. Thread M8 x 20 flange head bolt (8) through rear hole of clip into engine at Location F. Insert M8 x 25 button socket head bolt (9) into front hole of clip, through stator with bushing (2), and thread M8 flange nut (4) onto bolt.
7. Install fittings into pump (10). Bolt pump onto pump plate (1) with two 3/8 x 1 1/4 bolts (16) and two 3/8 flat washers (17). Make sure the suction fitting on the inside is pointing towards the front of the truck to just clear the pump bracket. **Do not mount clutch at this time.**
8. Install bracket (1) with pump onto the truck using M8 x 120 socket head bolt (6) at location A, M8 x 130 hex head bolt (5) at Location B and M8 x 140 hex head bolt (7) at location C as shown in Fig. 3.
9. Attach coil (11a) with four 1/4 x 1/2 flange bolts (11b) supplied with clutch. Attach clutch pulley (11c) to pump shaft with 5/16NF x 1 1/4 bolt (11d) and heavy washer (11e) supplied with clutch.
10. Make all hose connections to the pump.
11. Reinstall the intake air tube and air cleaner lid as removed.
12. Reconnect the battery.
13. Run the engine and check for any clearance or alignment problems. Adjust as needed.



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