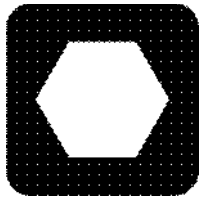


# FM25

## Parts Manual



# ***Ditch Witch®***


## **FM25**

ISSUE NO. 03PL-6/11

For Replacement Copy Order **P/N 053-1153**

This manual contains information concerning the following models:  
**FM25**

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 **Ditch Witch**, Ditch Witch, CMW, AutoCrowd, Modularmatic, Jet Trac, Roto Witch, Subsite, Fluid Miser, Perma-Soil, Power Pipe, Super Witch, Super Witch II, Pierce Arrow, The Underground, and The Underground Authority Worldwide are registered trademarks of The Charles Machine Works, Inc.

ID0197725



# FOREWORD

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This manual contains illustrated parts lists to help you select quality ProTech<sup>®</sup> Replacement parts for your Ditch Witch<sup>®</sup> equipment. Using other replacement parts will lessen the productivity of your equipment.

- ◆ Part numbers enclosed in a box are no longer available from The Charles Machine Works, Inc. Your local Ditch Witch dealer may be able to locate the part for you.
- ◆ Footnotes provide more information to help you identify parts shown in the manual.
- ◆ Assembly instructions and Tech Bits articles referenced in footnotes are available through your local Ditch Witch dealer.
- ◆ Description and specifications in this book were current at publication. However, The Charles Machine Works, Inc. reserves the right to improve equipment, so this manual might not reflect the most current improvements.
- ◆ Instructions on recommended equipment use and maintenance are in the Operator's Manual that was shipped with your equipment.

**Keep the following in mind when ordering ProTech replacement parts:**

- ◆ Specify parts you need by part number and description, not by illustration reference numbers.
- ◆ Have equipment model and serial number on hand to help ensure you get the right parts for your machine whether it's old or new.

**Thank you for buying and using Ditch Witch equipment and ProTech replacement parts.**

# WARRANTY

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DW WARRANTY Policy  
July, 2005

## **POLICY 1: DITCH WITCH® EQUIPMENT AND REPLACEMENT PARTS LIMITED WARRANTY POLICY**

Subject to the limitation and exclusions herein, free replacement parts will be provided at any authorized Ditch Witch dealership for any Ditch Witch equipment or parts manufactured by The Charles Machine Works, Inc. (CMW) that fail due to a defect in material or workmanship within one (1) year of first commercial use (Exception: 2 years for all SK500 Attachments). Free labor will be provided at any authorized Ditch Witch dealership for installation of parts under this warranty during the first year following "initial commercial" use of the serial numbered Ditch Witch equipment on which it is installed. The customer is responsible for transporting their equipment to an authorized Ditch Witch dealership for all warranty work.

### **EXCLUSIONS FROM PRODUCT WARRANTY**

- All incidental or consequential damages.
- All defects, damages, or injuries caused by misuse, abuse, improper installation, alteration, neglect, or uses other than those for which products were intended.
- All defects, damages, or injuries caused by improper training, operation, or servicing of products in a manner inconsistent with manufacturer's recommendations.
- All engines and engine accessories (these are covered by original manufacturer's warranty).
- Tires, belts, and other parts which are subject to another manufacturer's warranty. (Such warranty will be available to purchaser.)
- ALL IMPLIED WARRANTIES NOT EXPRESSLY STATED HEREIN, INCLUDING ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY.

IF THE PRODUCTS ARE PURCHASED FOR COMMERCIAL PURPOSES, AS DEFINED BY THE UNIFORM COMMERCIAL CODE, THEN THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF AND THERE ARE NO IMPLIED WARRANTIES OF ANY KIND WHICH EXTEND TO A COMMERCIAL BUYER. ALL OTHER PROVISIONS OF THIS LIMITED WARRANTY APPLY INCLUDING THE DUTIES IMPOSED.

Ditch Witch products have been tested to deliver acceptable performance in most conditions. This does not imply they will deliver acceptable performance in all conditions. Therefore, to assure suitability, products should be operated under anticipated working conditions prior to purchase.

Defects will be determined by an inspection within thirty (30) days of the date of failure of the product or part by CMW or its authorized dealer. CMW will provide the location of its inspection facilities or its nearest authorized dealer upon inquiry. CMW reserves the right to supply remanufactured replacement parts under this warranty as it deems appropriate.

Extended warranties are available upon request from your local Ditch Witch dealer or CMW.

Some states do not allow exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply. Further, some states do not allow exclusion of or limitation of how long an implied warranty lasts, so the above limitation may not apply. This limited warranty gives product owner specific legal rights and the product owner may also have other rights which vary from state to state.

For information regarding this limited warranty, contact CMW's Product Support Department, P.O. Box 66, Perry, OK 73077-0066, or contact your local Ditch Witch dealer.

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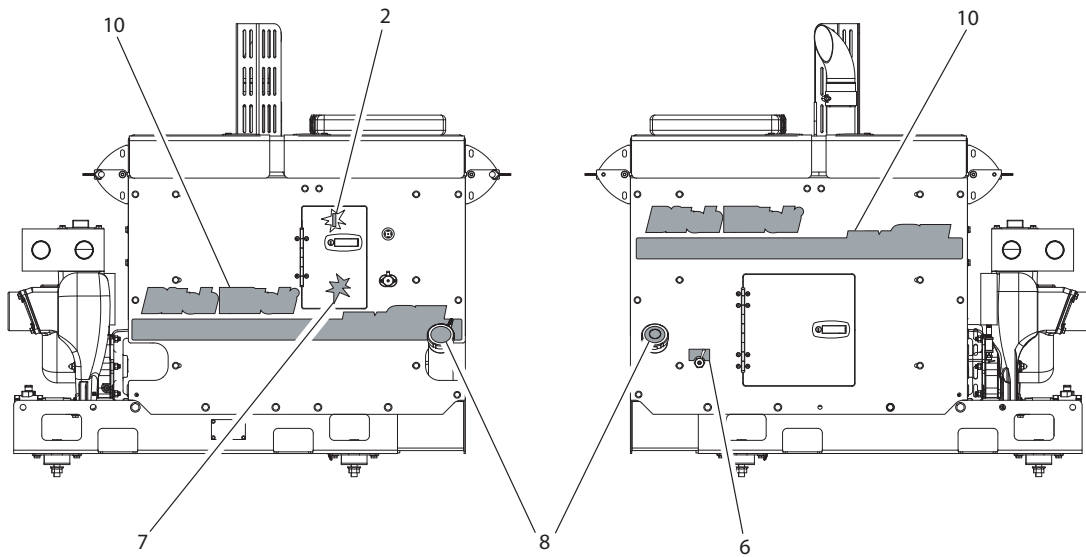
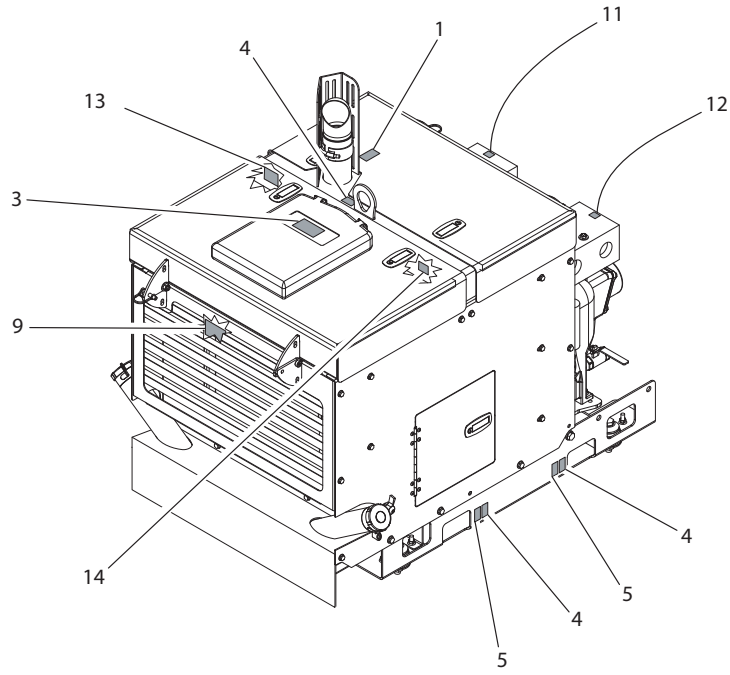
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# DECALS



# DECAL LOCATION FM25



# DECAL LOCATION

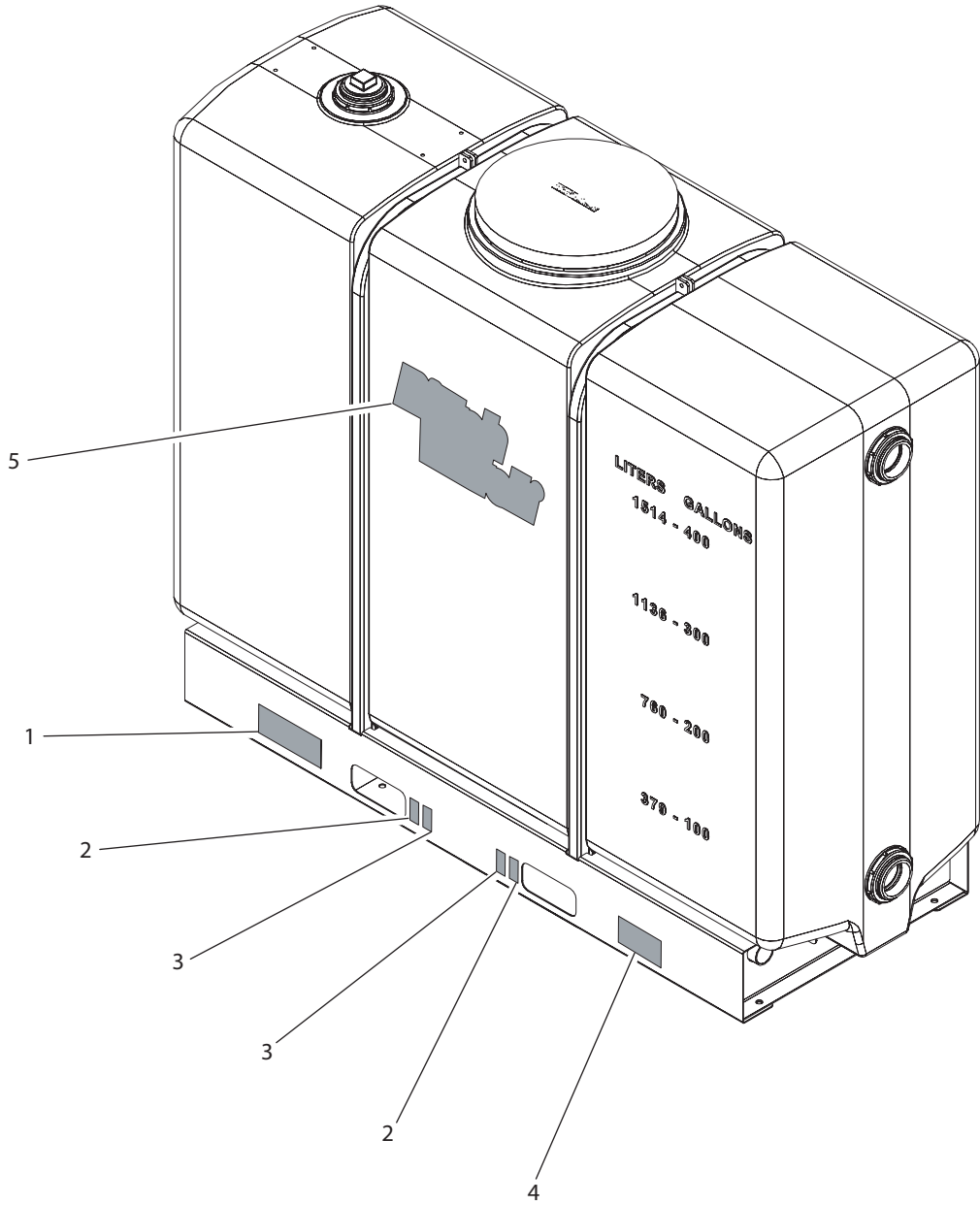
## FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	270-1936		DECAL KIT - FM25	
1	275-355	1	CAUTION HOT PARTS	
2	270-1937	1	LED DISPLAY	
3	273-562	1	NOTICE READ MANUAL	
4	274-442	5	LIFT LOCATION	
5	274-318	4	TIE DOWN LOCATION	
6	274-375	1	MASTER DISCONNECT SWITCH	
7	270-1935	1	FM25 CONTROL PANEL	
8	700-062	2	DIESEL FUEL CAP	
9	273-146	1	NOTICE, ADD COOLANT	
10	270-1917	2	FM25 MODEL ID W/ LOGOTYPE	
11	270-2090	1	PUMP 1	
12	270-2091	1	PUMP 2	
13	270-2097	1	ELECTRICAL BLOCK	
14	270-1452	1	FUSE BLOCK	

FOOTNOTES:

# DECAL LOCATION

FM13v FM25 500g



## DECAL LOCATION

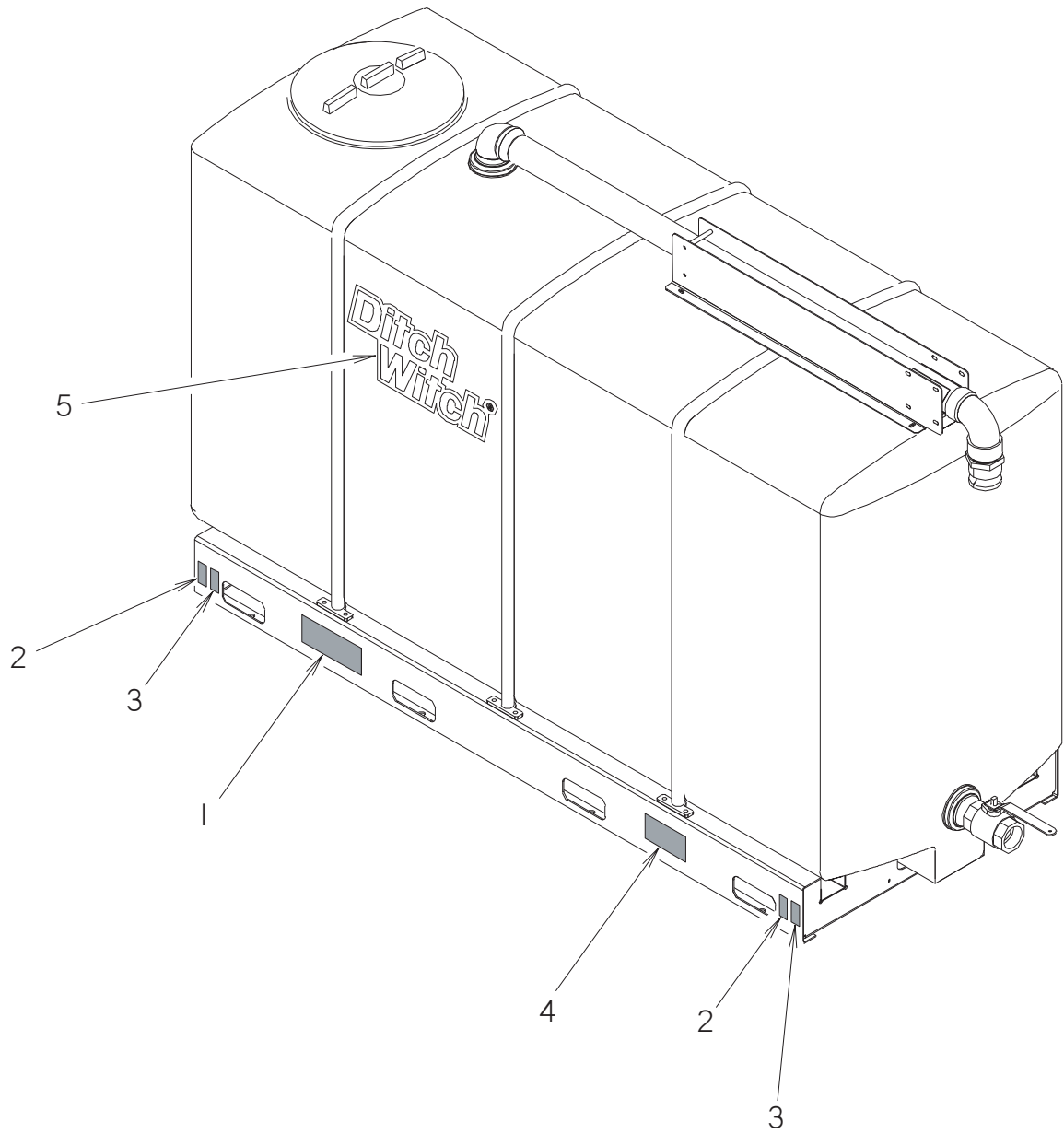
### FM13v FM25 500g

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	270-1583		DECAL KIT - 500 GAL TANK	
1	274-049	2	DANGER ELECTROCUTION	
2	274-318	4	TIE DOWN LOCATION	
3	274-442	4	LIFT LOCATION	
4	274-817	2	NOTICE DO NOT LIFT	WITH FLUID
5	700-230	2	18" STACKED DITCH WITCH	

FOOTNOTES

# DECAL LOCATION

FM13v FM50 FM25 1000g



# DECAL LOCATION

## FM13v FM50 FM25 1000g

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	275-876		DECAL KIT - FM50 TANK	
1	274-049	2	DANGER ELECTROCUTION	
2	274-318	4	TIE DOWN LOCATION	
3	274-442	4	LIFT LOCATION	
4	274-817	2	NOTICE DO NOT LIFT	WITH FLUID
5	700-230	2	18" STACKED DITCH WITCH	

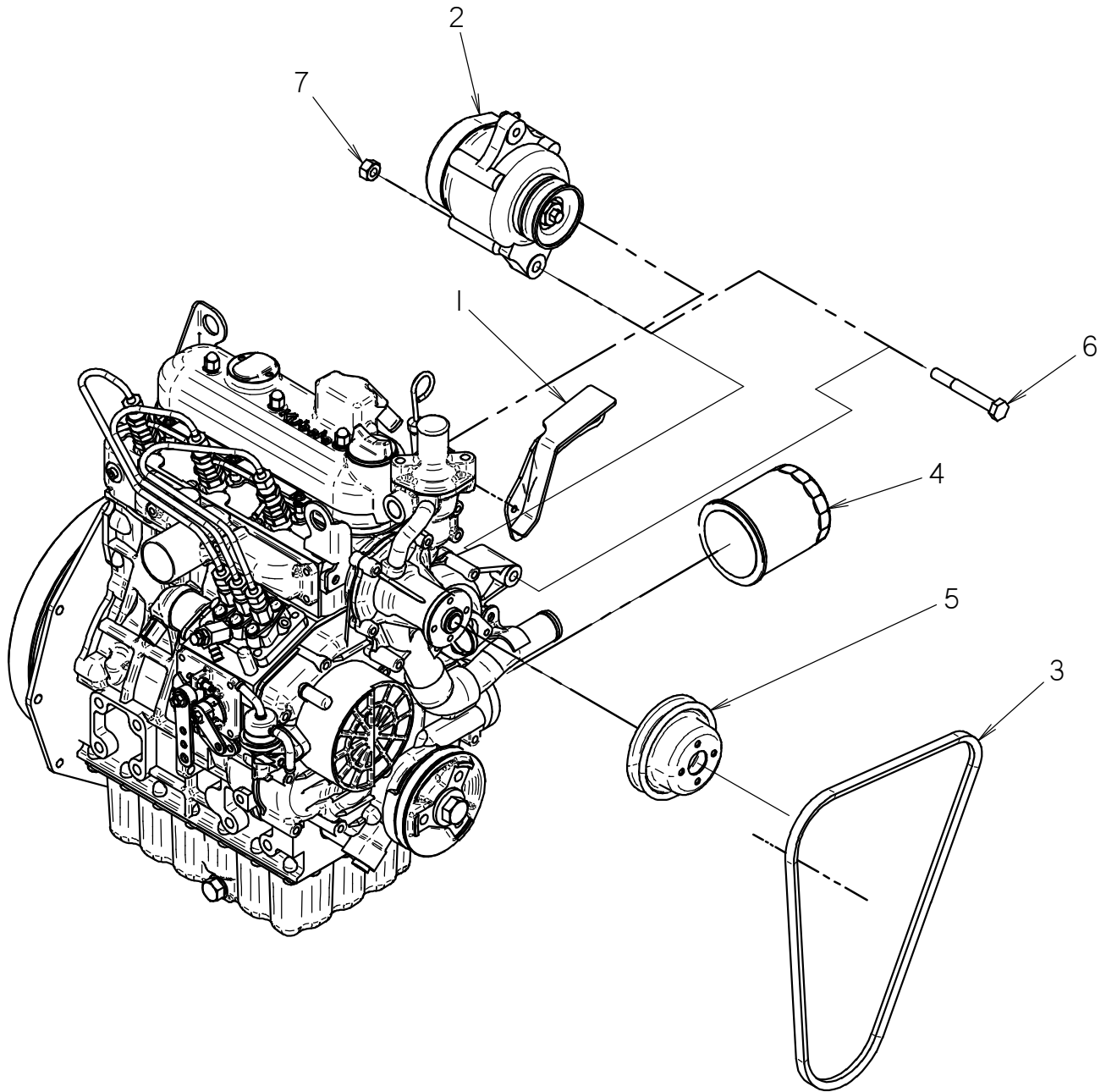
FOOTNOTES



# **ENGINE COMPONENTS**



# ENGINE FM25



# ENGINE

## FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-6685	1	ALTERNATOR BRACKET	
2	217-453	1	ALTERNATOR	
3	171-017	1	FAN BELT	
4	194-041	1	OIL FILTER ELEMENT	
5	194-380	1	FAN PULLEY	
6	106-617	1	SCREW (M10-1.50 X 80MM)	
7	105-894	1	LOCKNUT(M10-1.50,PRV TRQ,10.9)	

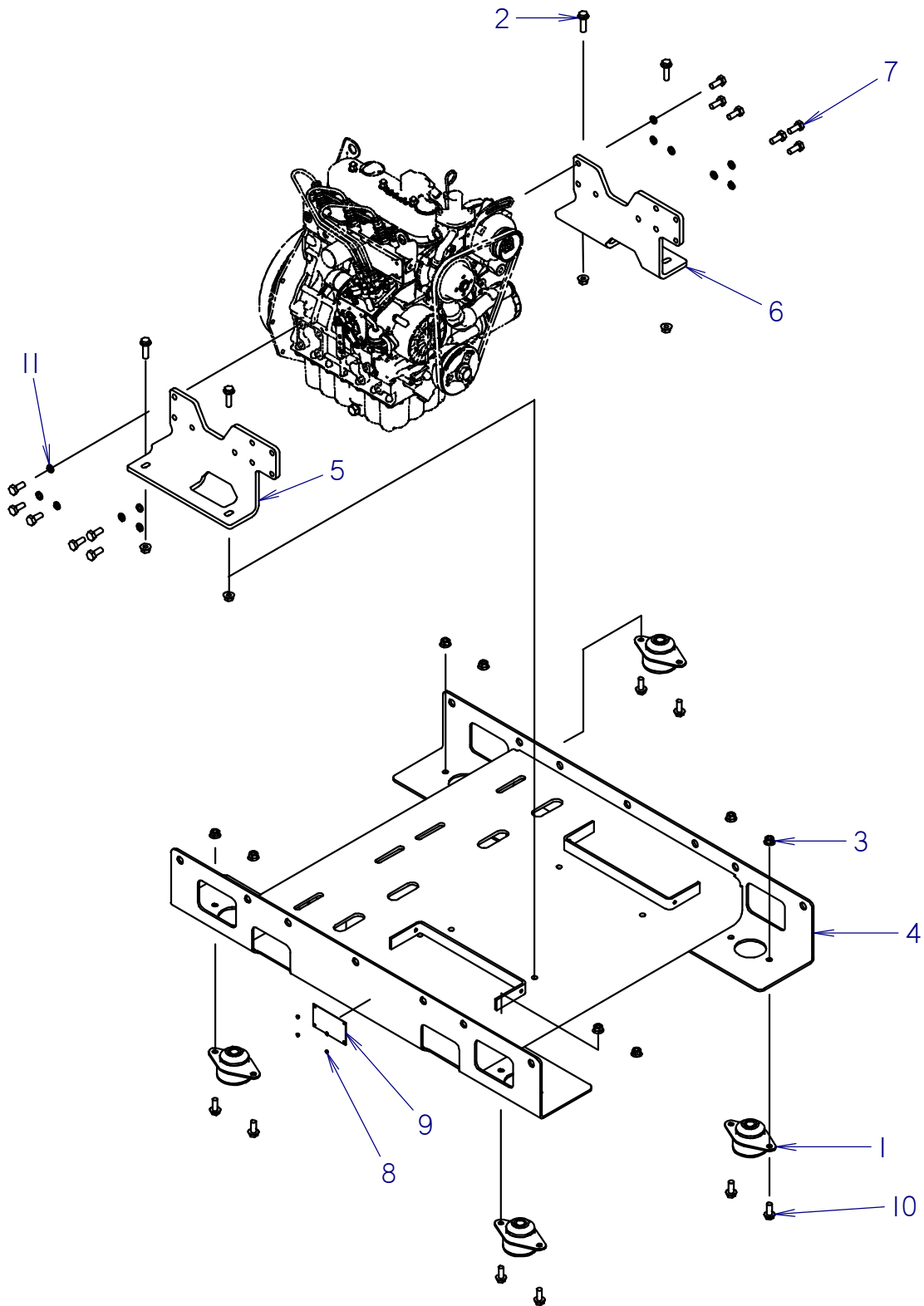
### NOT SHOWN:

194-378	1	FLYWHEEL AND RING GEAR
194-379	1	FUEL PUMP, MECHANICAL
194-383	3	GLOW PLUG
217-952	1	OIL PRESSURE SWITCH
213-306	1	STOP SOLENOID
194-386	1	FUEL FILTER ELEMENT
194-382	1	STARTER
194-100	1	FAN SPACER
054-051	1	OPERATOR MANUAL
213-338	1	TEMPERATURE SWITCH
194-210	1	THERMOSTAT
153-352	1	THERMOSTAT GASKET
194-218	1	WATER PUMP
153-353	1	WATER PUMP GASKET
499-827	1	OIL FILLER PLUG
155-748	1	O-RING (916 D90)
194-381	1	INJECTION PUMP

### FOOTNOTES:

### NOTE:

# ENGINE BASE



# ENGINE BASE

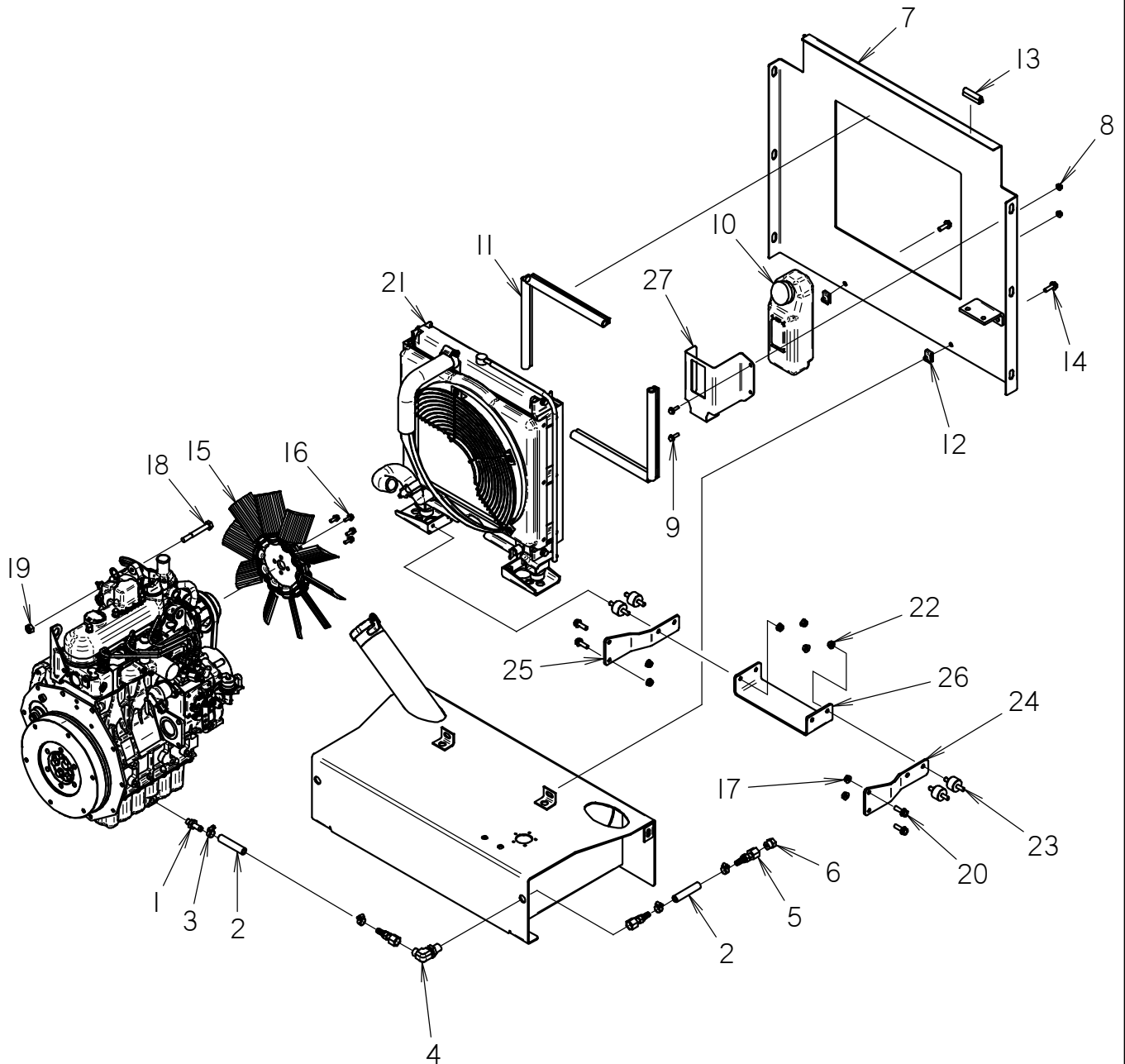
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	116-673	4	SHOCK MOUNT	
2	106-993	4	FLG LK SCREW (M10-1.50 X 35MM)	
3	106-387	12	FLG LOCKNUT (M10-1.50)	
4	300-2964	1	ENGINE BASE	
5	300-5297	1	ENGINE MOUNT	
6	300-5298	1	ENGINE MOUNT	
7	111-054	12	SCREW (M10-1.25 X 25MM)	
8	110-384	4	METAL TACK (.250" X .142")	
9	250-071	1	PRODUCT ID PLATE	
10	106-724	8	FLG SCREW (M10-1.50 X 25MM)	
11	106-090	12	LOCK WASHER (M10)	

NOT SHOWN:

FOOTNOTES:

NOTE:

## RADIATOR



# RADIATOR

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	153-702	1	ADAPTER (M12-1.25 X 06H)	
2	116-881	32	BULK HOSE (3/8", SOLD PER FT)	A-1 @ 8.5"; B-1 @ 23"
3	110-249	4	WORM CLAMP (1/4" TO 5/8")	
4	154-229	1	BK CONNECTOR (060-06090BK)	
5	157-947	3	FITTING (060-06H)	
6	154-330	1	PLUG (060)	
7	300-3365	1	COOLER PLATE	
8	106-385	2	FLG LOCKNUT (M6-1.00)	
9	106-379	2	FLG LK SCREW (M6-1.00 X 20MM)	
10	364-566	1	COOLANT OVERFLOW RESERVOIR	
11	116-489	AR	BULK EDGE (1/8",SOLD PER FT)	1 @ 64"
12	106-551	2	CLIP NUT (M8-1.25)	
13	116-578	25	BULK EDGE (1/8")	1 @ 25"
14	106-381	2	FLG LK SCREW (M8-1.25 X 25MM)	
15	215-1223	1	14" PUSHER FAN	
16	106-712	4	FLG SCREW (M6-1.00 X 16MM)	TORQUE BOLTS TO 8 INCH-LBS, USE LOCTITE 242 OR EQUIVALENT
17	105-003	4	FLG LOCKNUT (5/16-NC)	
18	106-617	1	SCREW (M10-1.50 X 80MM)	
19	105-894	1	LOCKNUT(M10-1.50,PRV TRQ,10.9)	
20	105-873	4	FLG LK BOLT (5/16-NC X 1")	
21	194-169	1	RADIATOR ASSEMBLY	SEE FOOTNOTE 1 FOR SERVICE PARTS
22	106-386	4	FLG LOCKNUT (M8-1.25)	
23	105-1228	4	BUFFER 30 X 20 A M8X20 CR45	
24	300-5276	1	RADIATOR MOUNT	
25	300-5277	1	RADIATOR MOUNT	
26	300-6586	1	SPACER	
27	300-6173	1	COOLANT BOTTLE BRACKET	

NOT SHOWN:

FOOTNOTES:

1. 153-716 RADIATOR CAP
- 153-688 TOP RADIATOR HOSE
- 153-689 BOTTOM RADIATOR HOSE

NOTE:



# FUEL TANK

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	116-325	2	GROMMET (.362")	
2	156-269	1	S/O COUPLER (04H-05H90)	
3	159-855	1	S/O COUPLER (04H90-05H90)	
4	118-096	26	BULK FUEL TUBING (1/4",PER FT)	A - 1 @ 8"; B - 1 @ 18"
5	194-505	1	FUEL PICKUP	
6	110-563	3	SPRING CLAMP (3/8")	
7	155-941	1	FUEL FILTER (05H-05H. IN-LINE)	
8	214-844	1	FUEL SENDER	
9	165-704	1	GASKET	
10	300-3365	1	COOLER PLATE	
11	106-381	2	FLG LK SCREW (M8-1.25 X 25MM)	
12	106-386	2	FLG LOCKNUT (M8-1.25)	
13	116-108	85	BULK HOSE (5/16", SOLD PER 1')	A - 1 @ 5"; B - 1 @ 26"; C - 1 @ 5"; D - 1 @ 21"; E - 1 @ 29"
14	110-249	10	WORM CLAMP (1/4" TO 5/8")	
15	300-2975	1	FUEL TANK	SEE FOOTNOTE 1 FOR SERVICE PARTS
16	194-386	1	FUEL FILTER ELEMENT	
17	105-214	5	FLG SCREW (#10-24 X .5")	
18	117-463	AR	LINER PAD (.25" THK)	

NOT SHOWN:

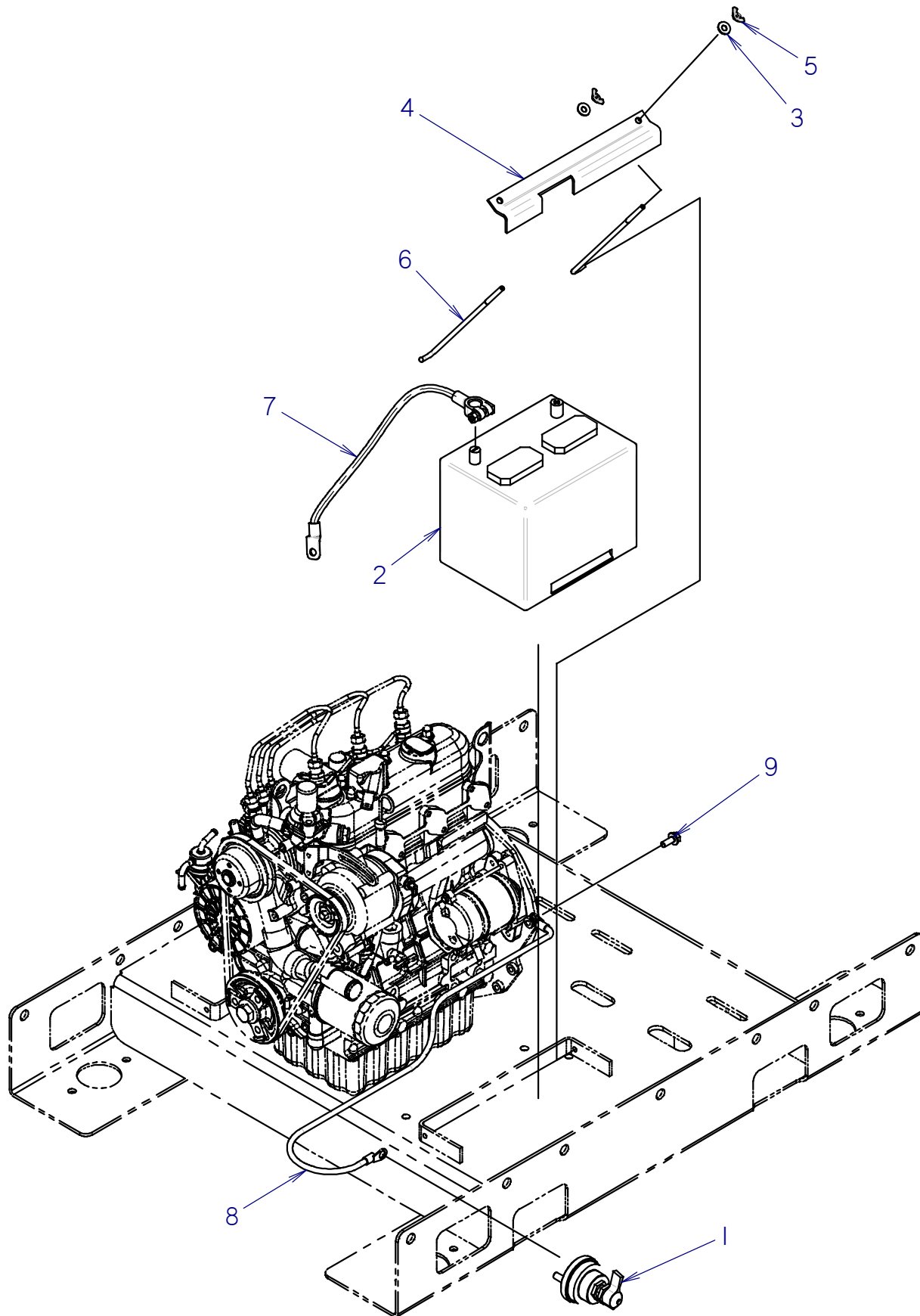
FOOTNOTES:

1. 111-065 FUEL CAP LOCKING, VENTED  
153-900 STRAINER

NOTE:



## BATTERY



# BATTERY

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	217-819	1	BATTERY DISCONNECT SWITCH	
2	215-258	1	BATTERY (12V, 675 AMP)	
3	105-095	2	WASHER (1/4")	
4	300-2969	1	BATTERY RETAINER	
5	195-339	2	WING NUT (1/4-NC)	
6	317-624	2	BATTERY BOLT	
7	215-307	1	BAT CABLE (4 GA X 20", BLACK)	
8	215-305	1	BAT CABLE (4 GA X 30", BLK)	
9	106-162	1	FLG SCREW (M8-1.25 X 20MM, GD8)	

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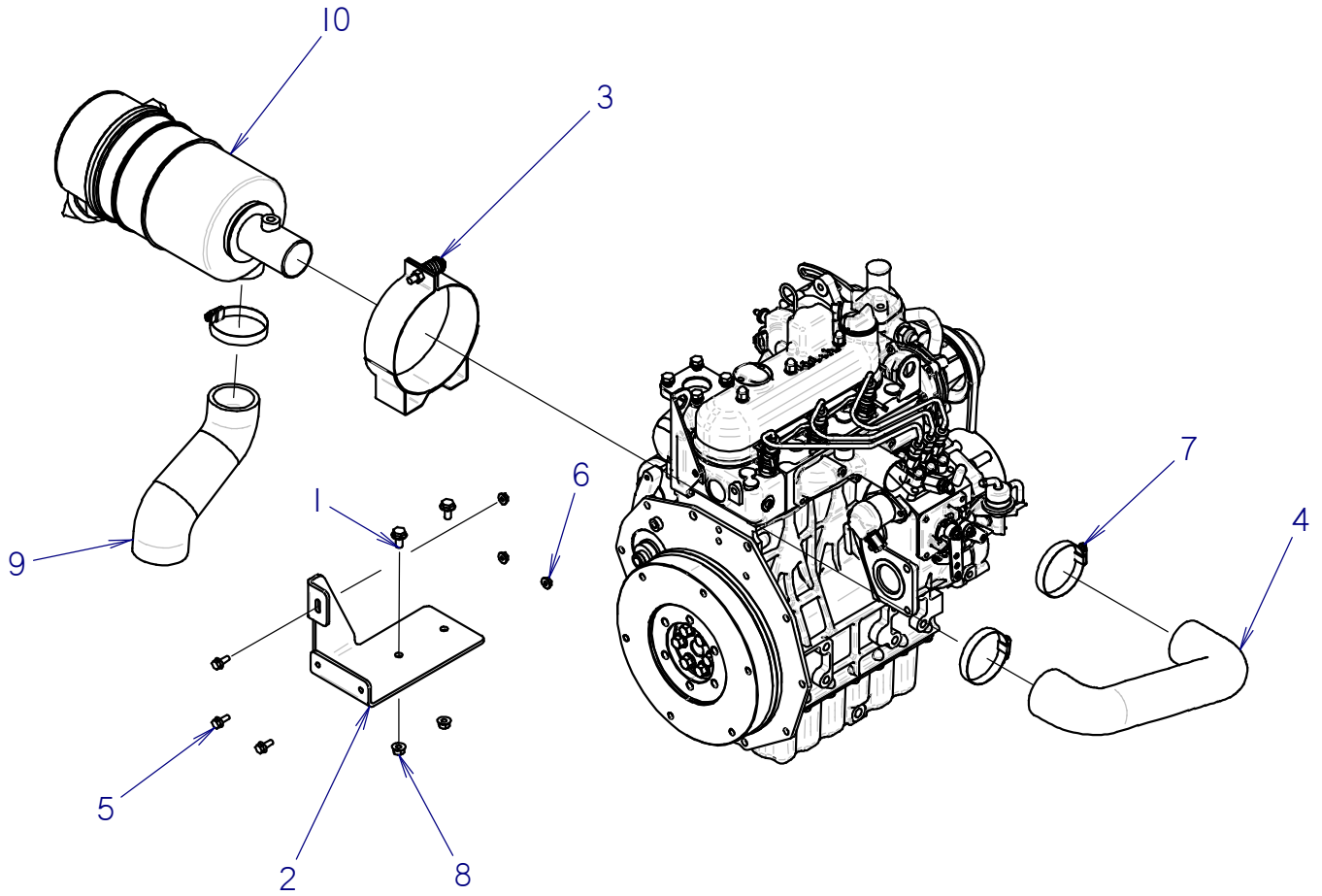
215-303 AR BAT CABLE (4 GA X 10", RED)  
 215-308 AR BAT CABLE (4 GA X 38", RED)

USE WHEN THE BATTERY IS ON THE ALTERNATOR SIDE  
 USE WHEN THE BATTERY IS ON THE OPPOSITE SIDE FROM THE ALTERNATOR

FOOTNOTES:

NOTE:

# AIR FILTER SYSTEM



# AIR FILTER SYSTEM

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	106-380	2	FLG LK SCREW (M8-1.25 X 16MM)	
2	300-2970	1	AIR FILTER BRACKET	
3	194-036	1	MOUNTING CLAMP (5.750")	
4	120-556	1	AIR INTAKE HOSE	
5	106-712	3	FLG SCREW (M6-1.00 X 16MM)	
6	106-385	3	FLG LOCKNUT (M6-1.00)	
7	110-134	3	WORM CLAMP (2.062" TO 2.750")	
8	106-386	2	FLG LOCKNUT (M8-1.25)	
9	116-030	1	LOWER COOLANT HOSE	
10	194-035	1	AIR FILTER PARTS ASS'Y	SEE FOOTNOTE 1 FOR SERVICE PARTS

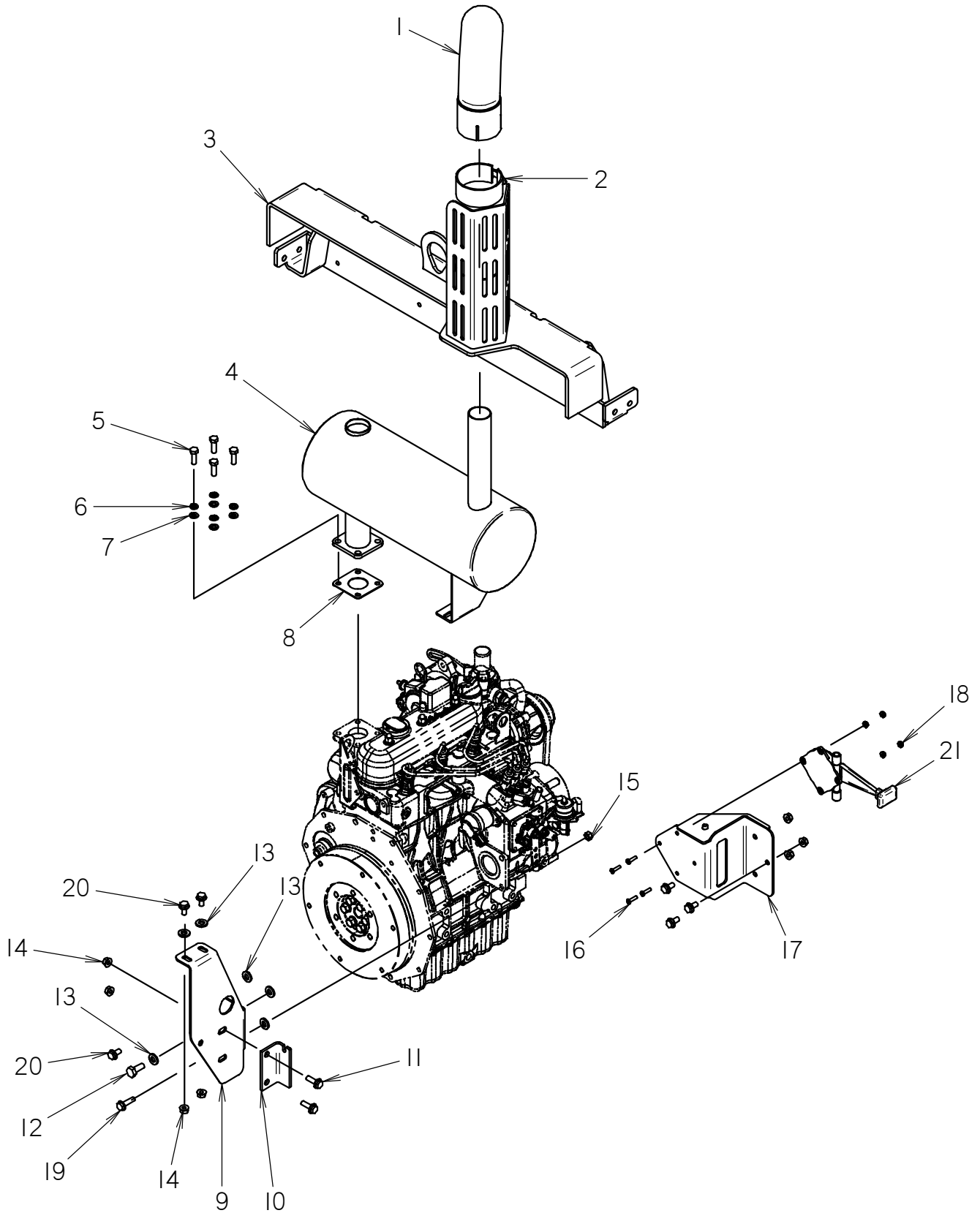
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FOOTNOTES:

1. 194-038 FILTER ELEMENT, PRIMARY  
194-039 FILTER ELEMENT, SECONDARY

NOTE:

# EXHAUST AND THROTTLE



# EXHAUST AND THROTTLE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	196-019	1	EXHAUST STACK	
2	194-049	1	CLAMP ASSEMBLY	
3	300-3064	1	CENTER SUPPORT	
4	194-365	1	EXHAUST MUFFLER	
5	105-806	4	SCREW (M8-1.25 X 25MM)	
6	105-091	4	LOCK WASHER (5/16")	
7	106-389	4	WASHER (M8)	
8	149-326	1	GASKET, MUFFLER	
9	309-610	1	MUFFLER BRACKET	
10	309-611	1	THROTTLE BRACKET	
11	106-381	2	FLG LK SCREW (M8-1.25 X 25MM)	
12	111-054	1	SCREW (M10-1.25 X 25MM)	
13	106-396	6	WASHER (M10, HARDENED)	
14	106-386	7	FLG LOCKNUT (M8-1.25)	
15	106-561	1	LOCKNUT (M8-1.25,PRV TRQ,10.9)	
16	106-049	4	BOLT (#10-24 X 3/4", PLPS)	
17	300-5245	1	THROTTLE BRACKET	
18	106-048	4	LOCKNUT (#10-24)	
19	106-163	1	FLG SCREW (M8-1.25 X 30MM)	
20	106-380	6	FLG LK SCREW (M8-1.25 X 16MM)	
21	195-1312	1	THROTTLE CABLE	SEE FOOTNOTE 1

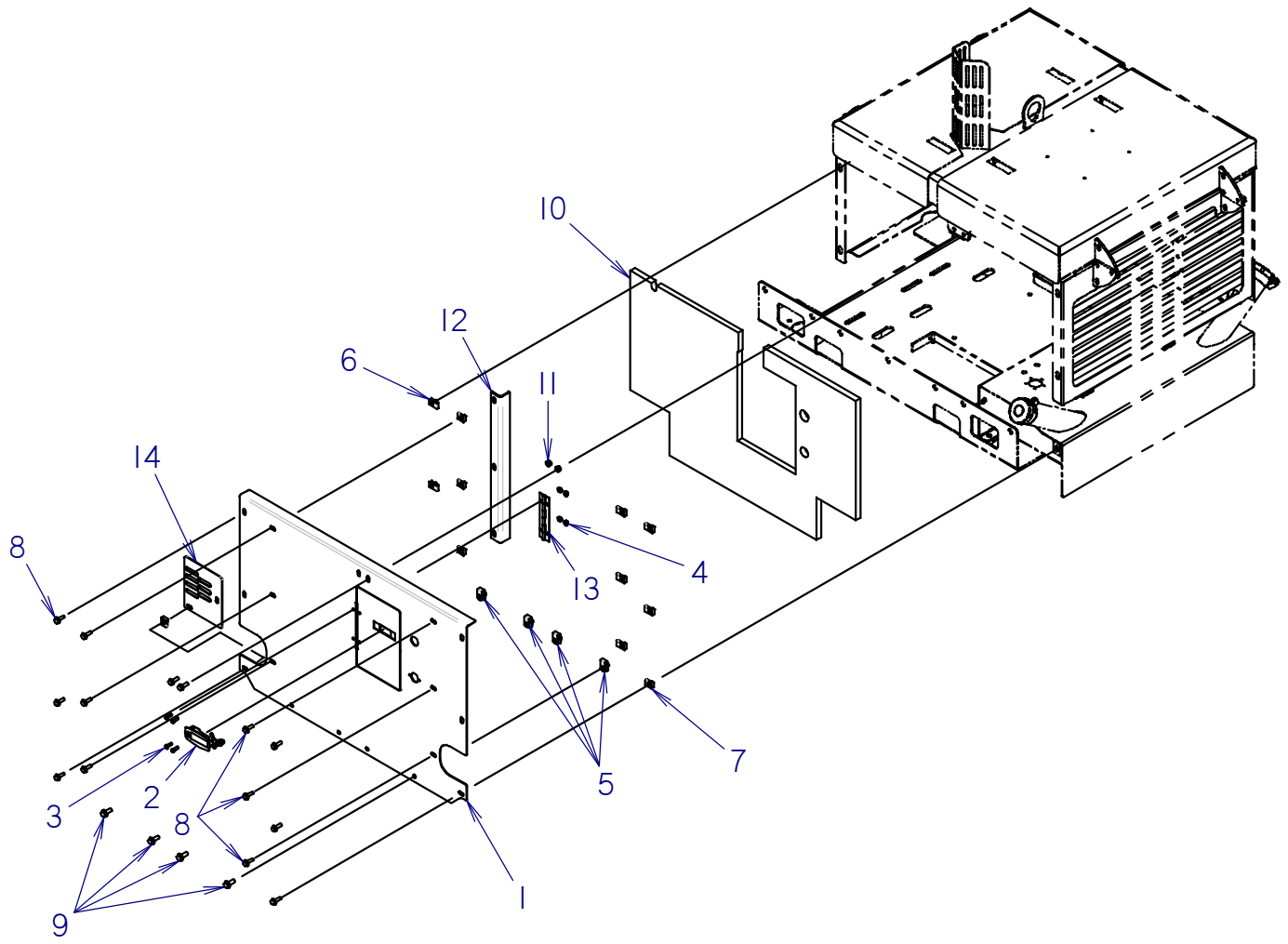
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FOOTNOTES:

1. CONNECT THROTTLE CABLE TO CENTER HOLE OF THROTTLE LINKAGE.

NOTE:

# COVER, CONTROL PANEL SIDE



## COVER, CONTROL PANEL SIDE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-2997	1	CONTROL SIDE PANEL	SEE FOOTNOTE 1 FOR REPLACEMENT DOOR
2	117-558	1	LATCH, ADJUST LEVER (LOCKING)	
3	106-640	4	SCREW (M6-1.00 X 20MM,BUT SOC)	
4	106-385	4	FLG LOCKNUT (M6-1.00)	
5	106-558	4	CLIP NUT (M10-1.50)	
6	107-135	7	CLIP NUT (M8-1.25)	
7	106-551	5	CLIP NUT (M8-1.25)	
8	106-381	14	FLG LK SCREW (M8-1.25 X 25MM)	
9	107-001	4	FLG LK SCREW (M10-1.50 X 25MM)	
10	362-1213	1	SOUND INSULATION	
11	106-386	2	FLG LOCKNUT (M8-1.25)	
12	300-4851	1	STIFFINER	
13	110-346	1	HINGE (6")	
14	300-5259	1	VENT PLATE	

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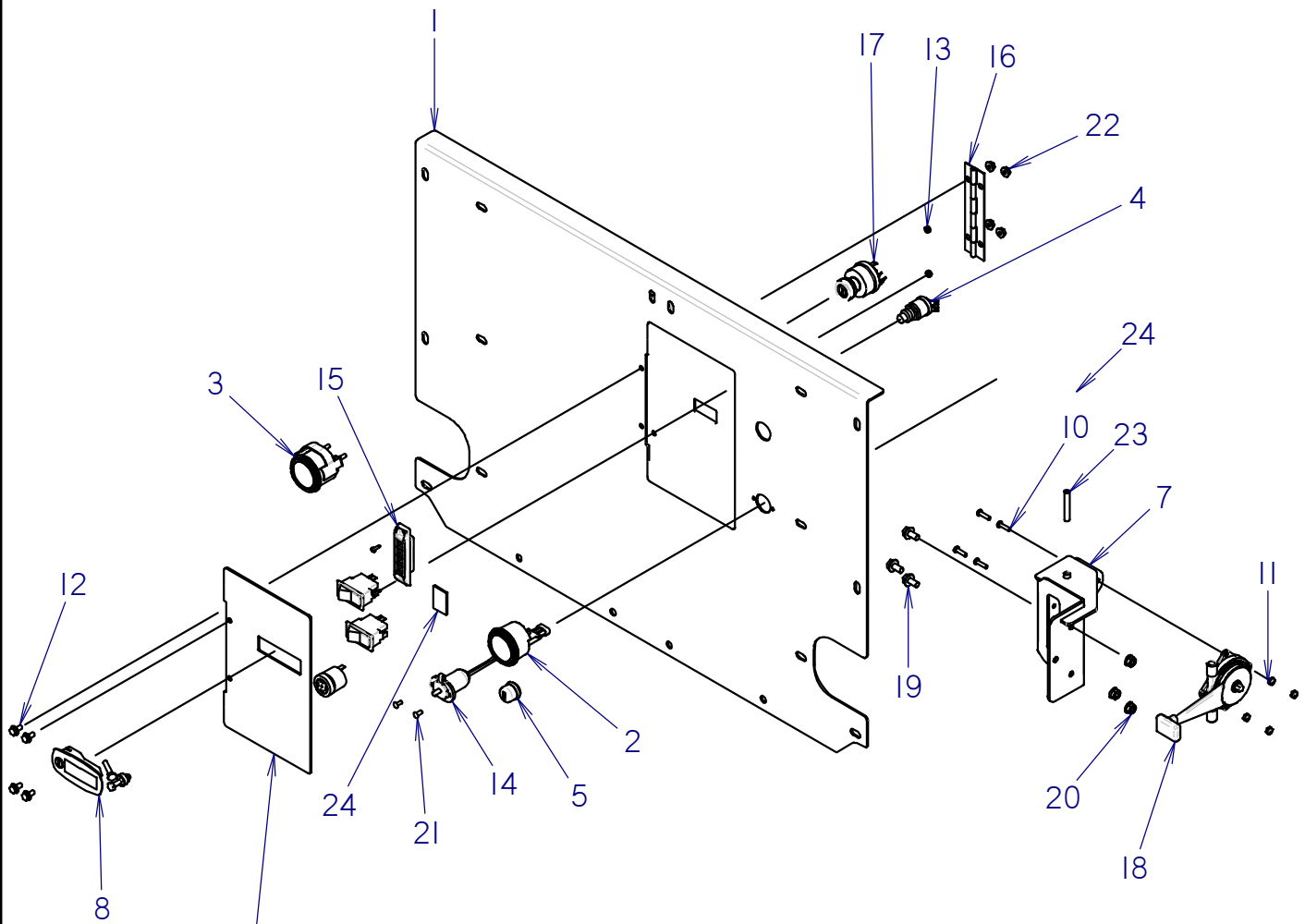
FOOTNOTES:

1. 300-2999 DOOR

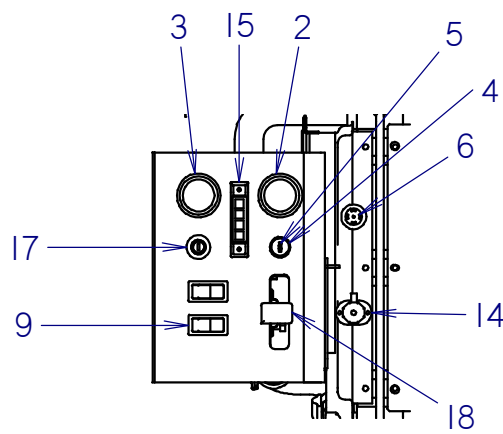
NOTE:



# CONTROL PANEL AND DOOR



SEE FOOTNOTE 1



PANEL LAYOUT

## CONTROL PANEL AND DOOR

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-2997	1	CONTROL SIDE PANEL	
2	215-128	1	HOUR METER	
3	215-133	1	FUEL GAUGE	
4	306-607	1	HORN BUTTON	
5	306-608	1	BUTTON COVER	
6	306-603	1	AUDIO ALARM	
7	300-5245	1	THROTTLE BRACKET	
8	117-558	1	LATCH, ADJUST LEVER (LOCKING)	
9	214-647	2	ROCKER SW (SPST) OFF-ON	
10	106-049	4	BOLT (#10-24 X 3/4", PLPS)	
11	106-048	4	LOCKNUT (#10-24)	
12	106-378	4	FLG LK SCREW (M6-1.00 X 12MM)	
13	107-859	2	NUT, LOCK, #6-32, NYLON INSERT	
14	214-301	1	ACCESSORY SOCKET	
15	220-664	1	INDICATOR ASSEMBLY	
16	110-346	1	HINGE (6")	
17	214-852	1	IGNITION SWITCH	
18	195-1312	1	THROTTLE CABLE	
19	106-380	3	FLG LK SCREW (M8-1.25 X 16MM)	
20	106-386	3	FLG LOCKNUT (M8-1.25)	
21	110-560	2	POP RIVET (3/16" X 1/2", ALUM)	
22	106-385	4	FLG LOCKNUT (M6-1.00)	
23	500-1529	1	SET SCREW (M8 X 50MM, SOC)	
24	362-1241	1	PAD	

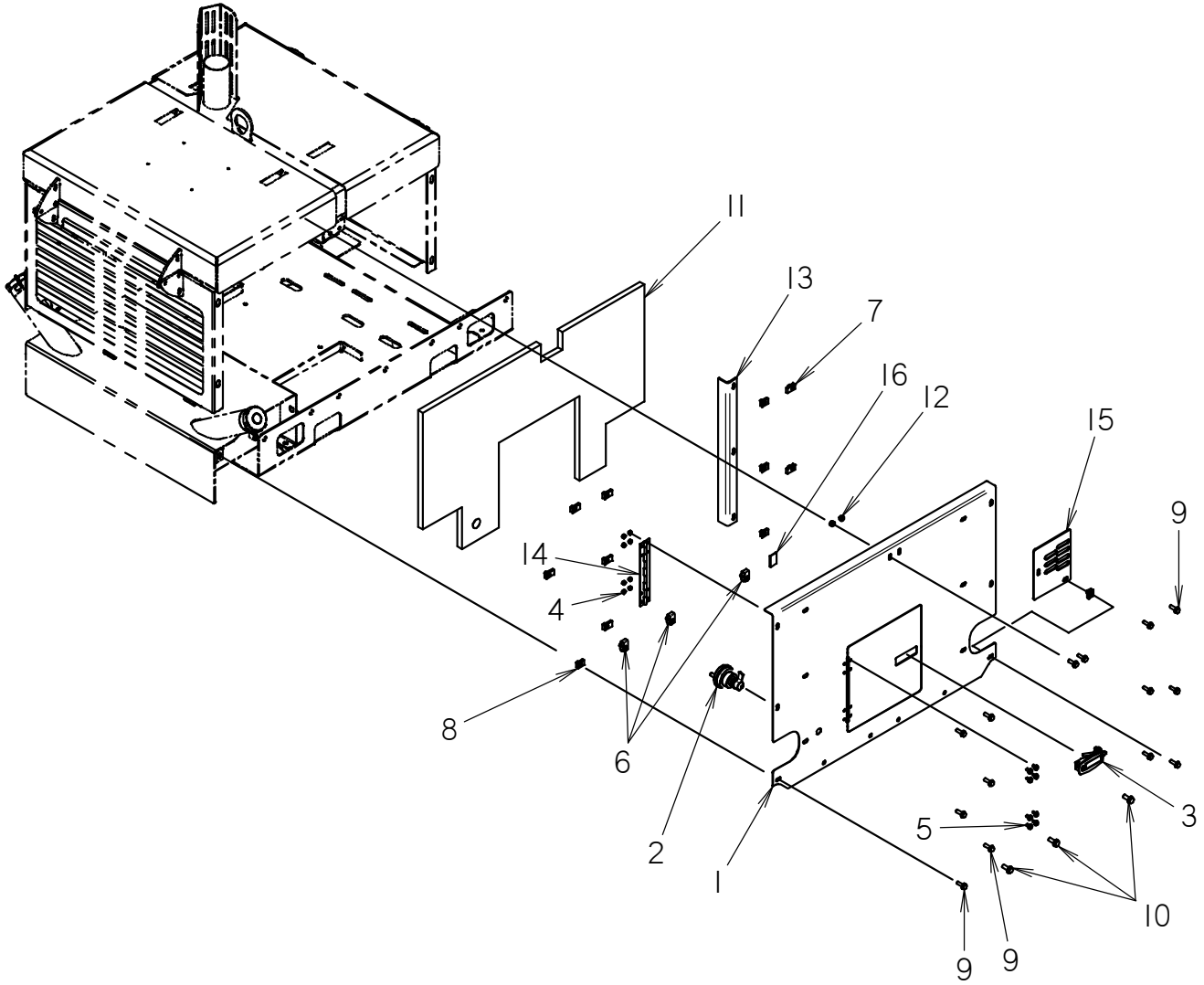
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FOOTNOTES:

1. 300-2999 REPLACEMENT DOOR

NOTE:

# COVER, BATTERY PANEL SIDE



# COVER, BATTERY PANEL SIDE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-2993	1	SIDE PANEL	SEE FOOTNOTE 1 FOR REPLACEMENT DOOR
2	217-819	1	BATTERY DISCONNECT SWITCH	
3	117-558	1	LATCH, ADJUST LEVER (LOCKING)	
4	106-237	8	LOCKNUT (M6-1.00,PRV TRQ,NLK)	
5	106-378	8	FLG LK SCREW (M6-1.00 X 12MM)	
6	106-558	3	CLIP NUT (M10-1.50)	
7	107-135	7	CLIP NUT (M8-1.25)	
8	106-551	5	CLIP NUT (M8-1.25)	
9	106-381	14	FLG LK SCREW (M8-1.25 X 25MM)	
10	107-001	3	FLG LK SCREW (M10-1.50 X 25MM)	
11	362-1215	1	SOUND INSULATION	
12	106-386	2	FLG LOCKNUT (M8-1.25)	
13	300-4851	1	STIFFINER	
14	110-778	1	HINGE (8.75")	
15	300-5259	1	VENT PLATE	
16	362-1241	1	PAD	

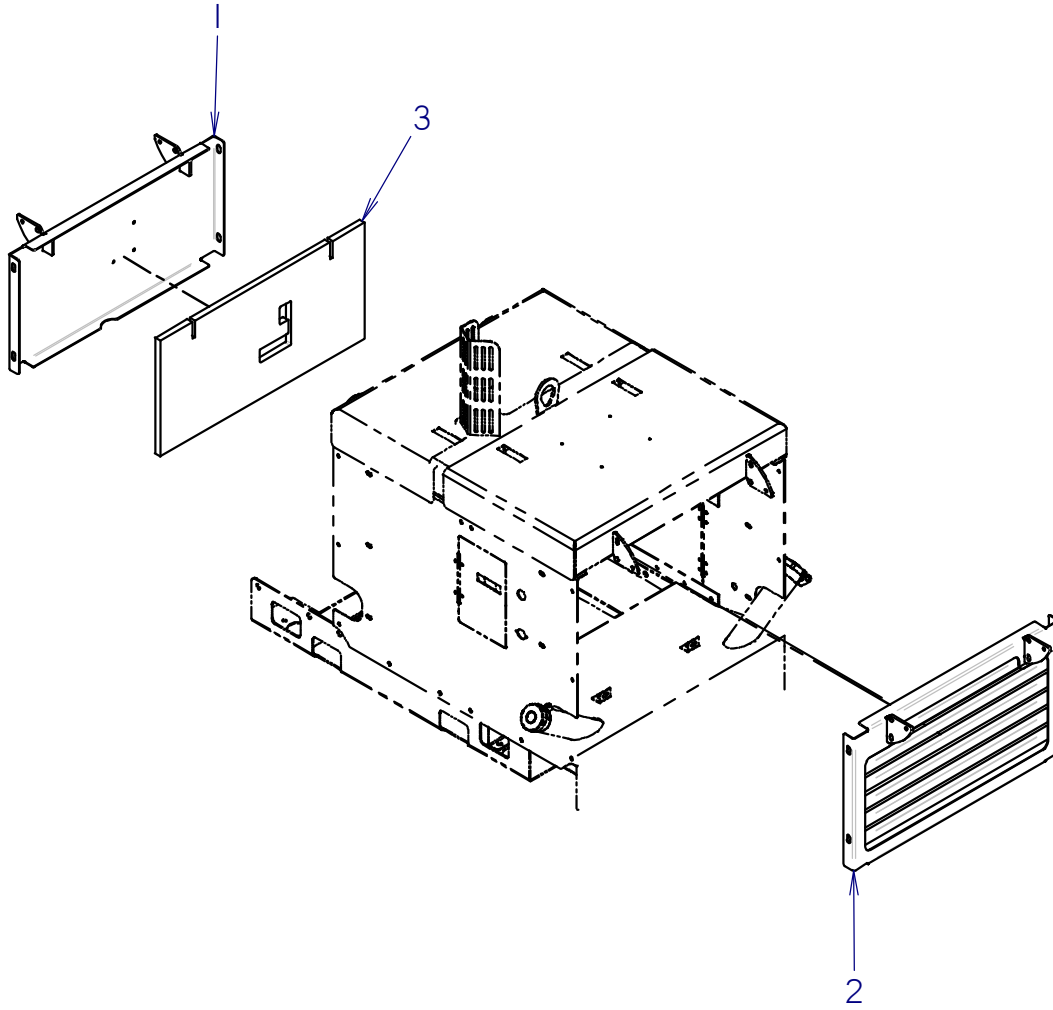
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FOOTNOTES:

1. 300-2994 DOOR

NOTE:

# COVERS, END PANELS



# COVERS, END PANELS

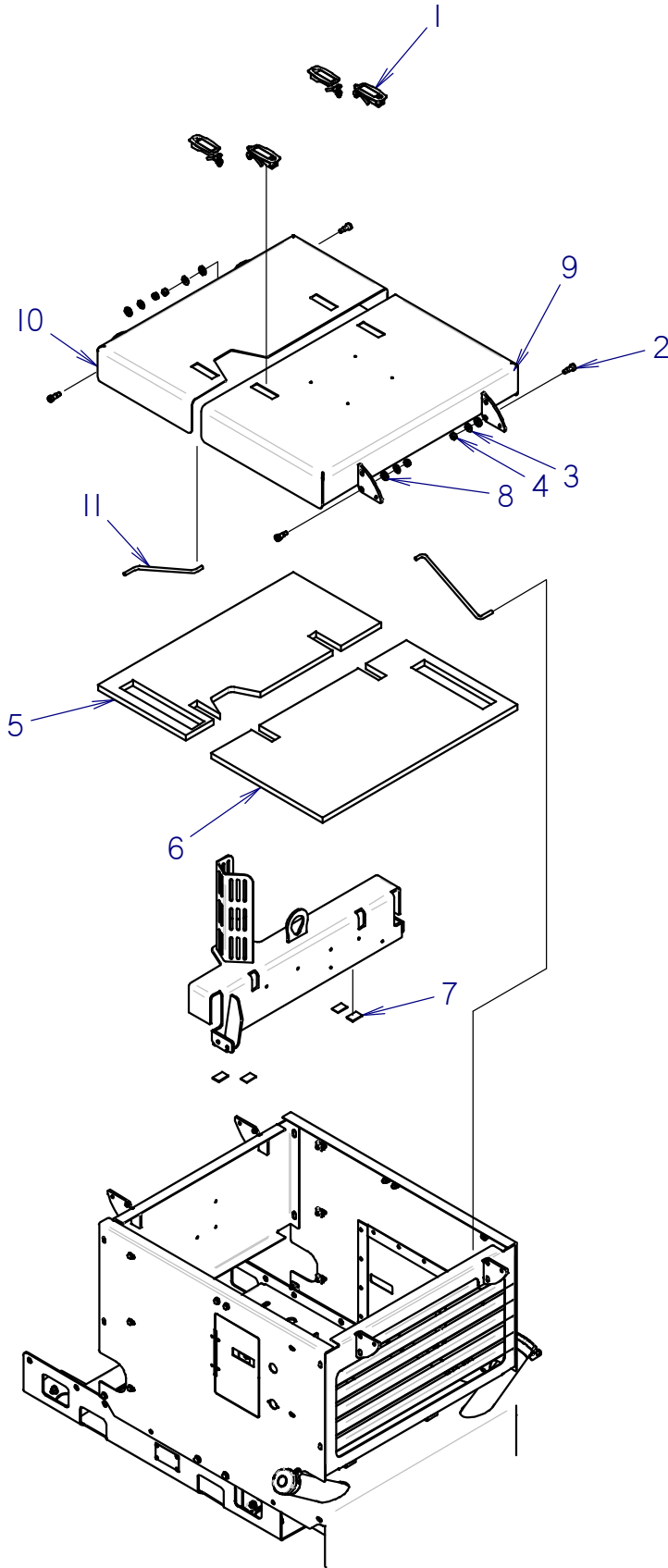
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-4952	1	END PANEL	
2	300-3038	1	END PANEL	
3	362-1214	1	SOUND INSULATION	

NOT SHOWN:

FOOTNOTES:

NOTE:

# TOP COVERS



# TOP COVERS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	117-558	4	LATCH, ADJUST LEVER (LOCKING)	
2	107-802	4	SHLD BLT (M12 X 16MM,M10-1.50)	
3	105-118	4	WASHER (3/8")	
4	106-758	4	LOCKNUT (M10-1.5)	
5	362-1218	1	SOUND INSULATION	
6	362-1217	1	SOUND INSULATION	
7	362-1241	4	PAD	
8	106-397	4	WASHER (M12, HARDENED)	
9	300-3056	1	LONG TOP COVER	
10	300-3059	1	TOP COVER	
11	179-583	2	PROP ROD	

NOT SHOWN:

FOOTNOTES:

NOTE:

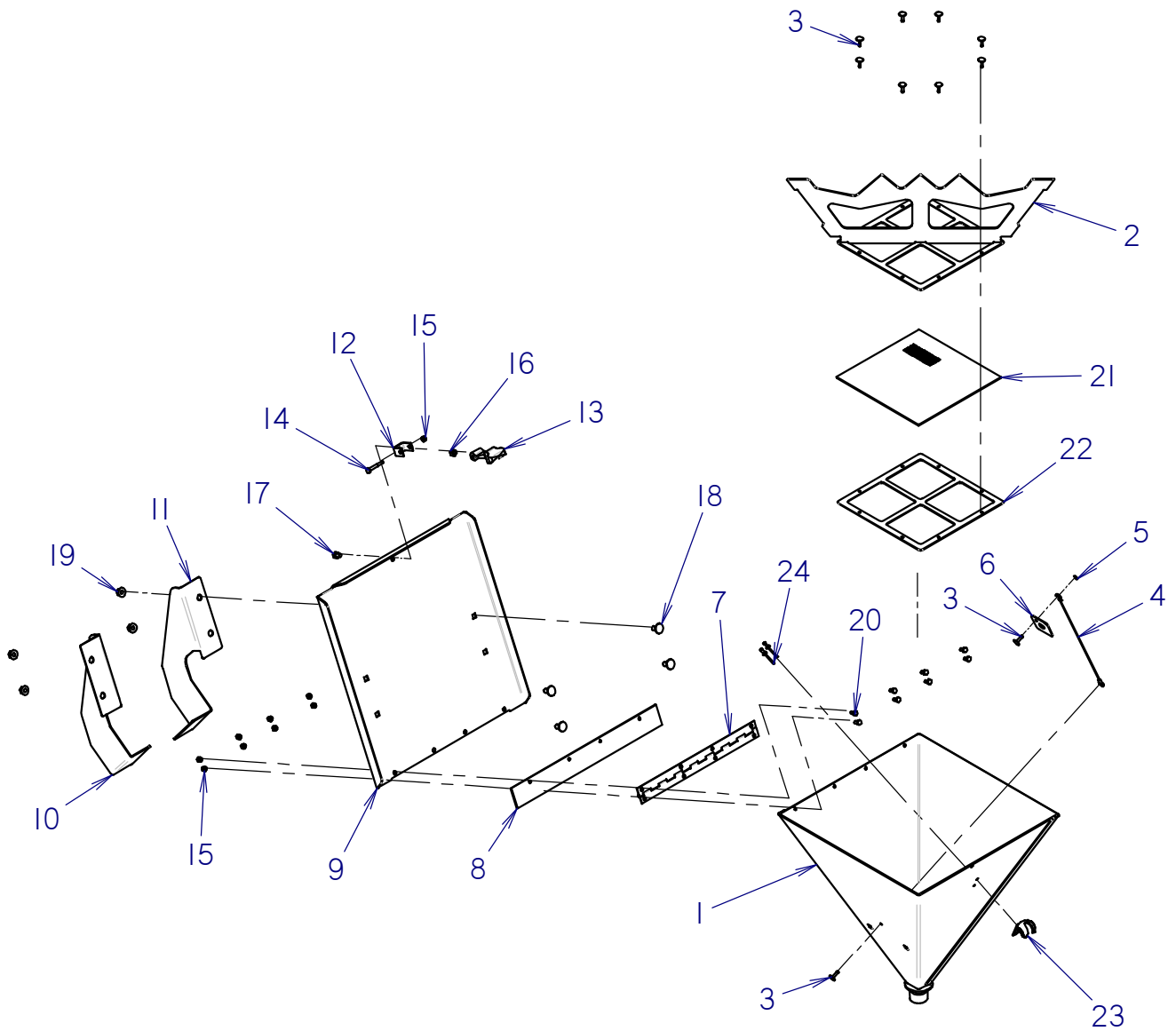




# HOPPERS

# HOPPER

FM5, FM13, FM13V, & FM25



# HOPPER

## FM5, FM13, FM13V, & FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	309-293	1	HOPPER WELDMENT	
2	310-210	1	BAG CUTTER	
3	110-348	10	POP RIVET (3/16" X .664")	
4	110-239	1	LANYARD CABLE (13.5")	
5	106-205	1	WASHER (1.91")	
6	309-914	1	METER PLATE	
7	110-430	1	HINGE (1.4-5/8")	
8	117-597	1	WEATHER FLAP	
9	309-090	1	COVER	
10	310-567	1	LEFT BRACKET	
11	310-566	1	RIGHT BRACKET	
12	110-224	1	ANCHOR BRACKET	
13	110-222	1	HOOD LATCH	
14	106-093	1	SCREW (M6-1.00 X 45MM)	
15	106-538	9	LOCKNUT (M6-1.00,PRV TRQ,10.9)	
16	106-561	1	LOCKNUT (M8-1.25,PRV TRQ,10.9)	
17	107-519	1	SCREW (M8-1.25 X 12MM)	
18	107-700	4	CARRIAGE BOLT (M10-1.50X20MM)	
19	106-387	4	FLG LOCKNUT (M10-1.50)	
20	106-234	8	SCREW (M6-1.00 X 12MM)	
21	305-621	1	SCREEN	
22	309-355	1	SCREEN FRAME	
23	110-223	1	LATCH BRACKET	
24	110-253	2	POP RIVET (3/16" X 1/2")	

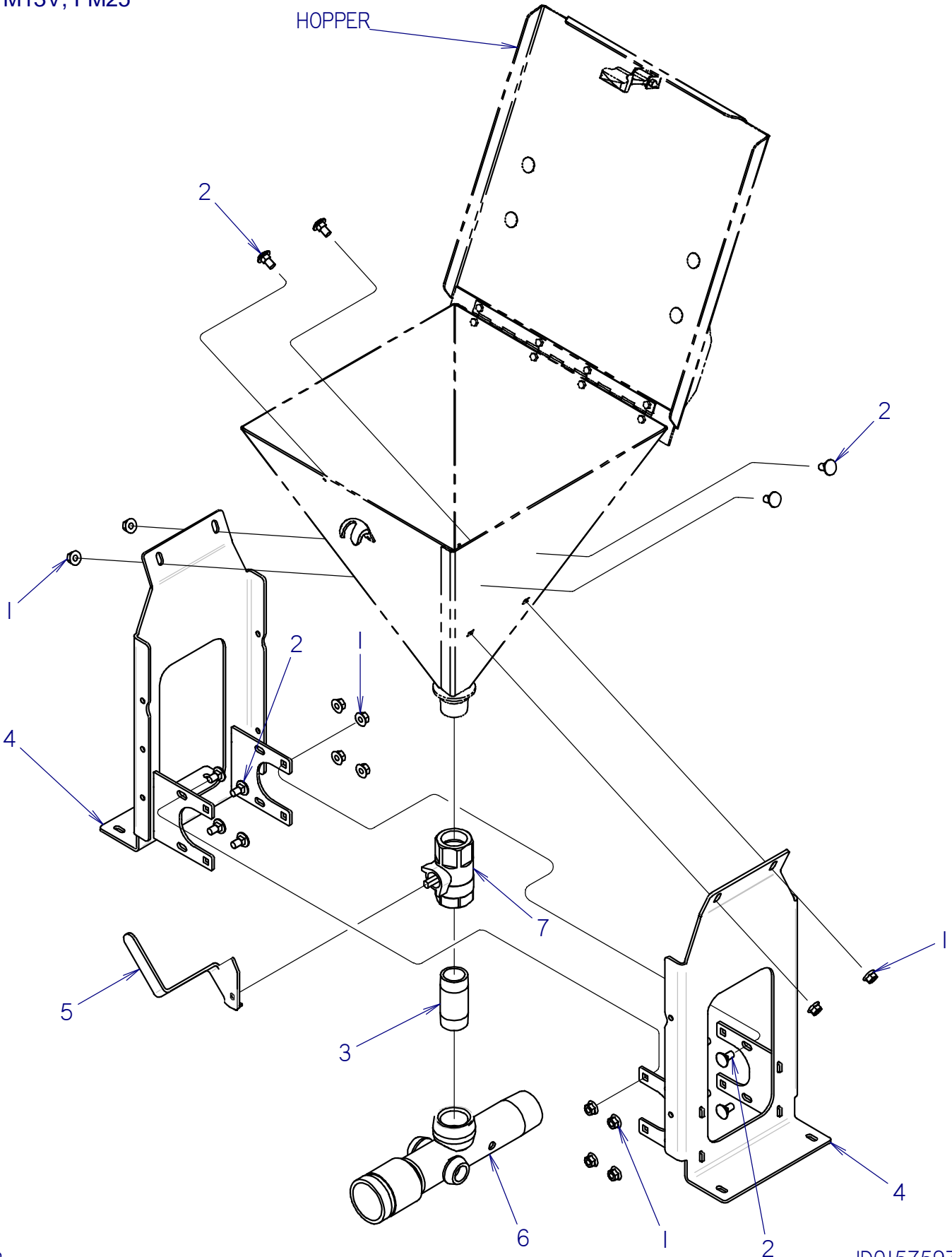
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FOOTNOTES:

NOTE:

# HOPPER BASE

FM13V, FM25



# HOPPER BASE

FM13V, FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	106-387	12	FLG LOCKNUT (M10-1.50)	
2	107-700	12	CARRIAGE BOLT (M10-1.50X20MM)	
3	150-1900	1	NIPPLE (20N-3.5")	
4	300-2478	2	HOPPER BASE	
5	300-4835	1	VALVE HANDLE	
6	310-327	1	MIXING VENTURI	
7	159-789	1	SHUT-OFF (20NF-20NF)	

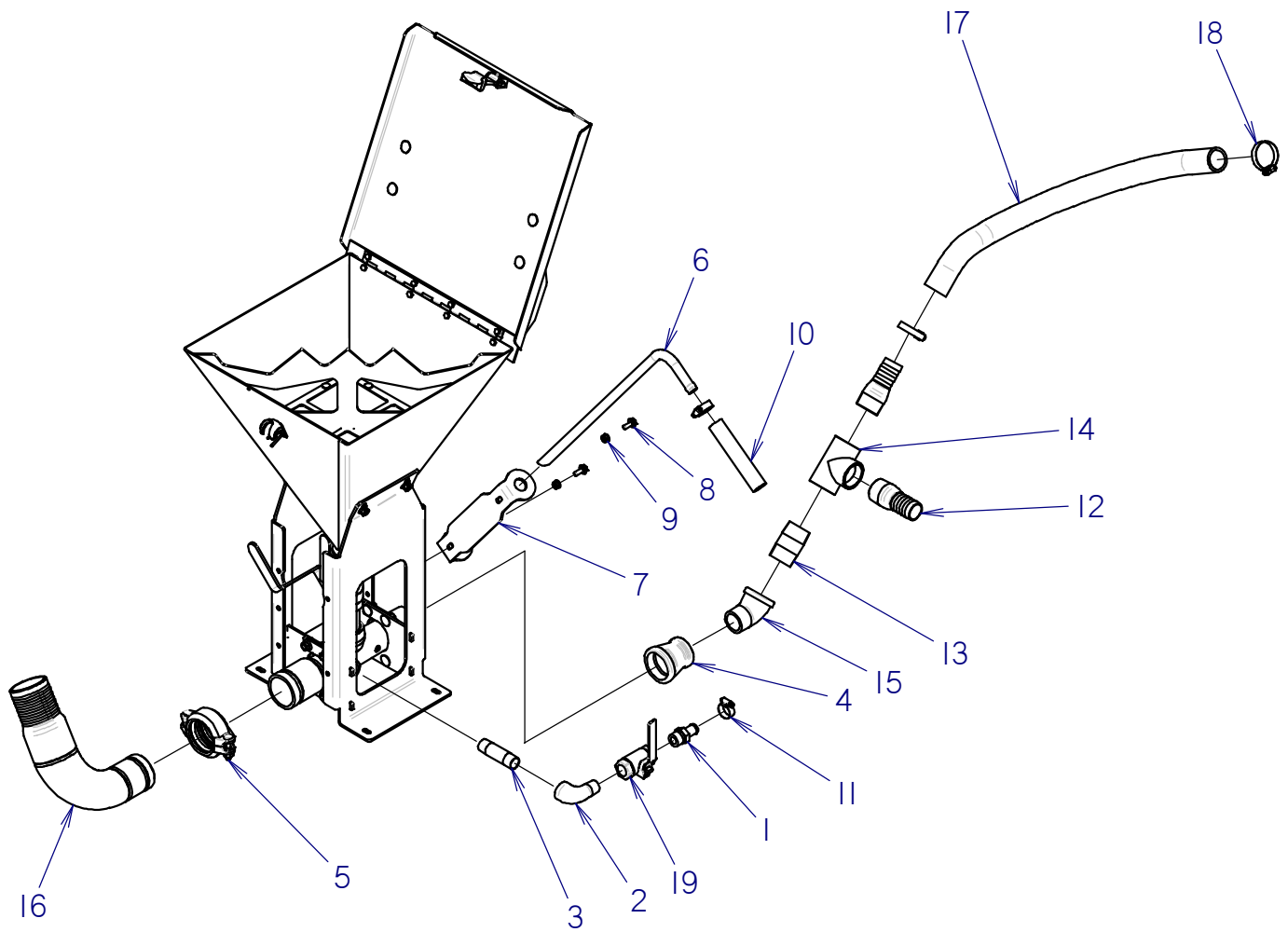
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FOOTNOTES:

NOTE:

# HOPPER INSTALLATION

FM25



# HOPPER INSTALLATION

## FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	514-161	1	S/O COUPLER (12N-12H)	
2	153-197	1	STREET ELBOW (12N-12NF90)	
3	114-021	1	NIPPLE (12N-3 1/2")	
4	157-300	1	-32FPT X -24FPT REDUCER	
5	166-357	1	GROOVED COUPLING (40-40)	
6	150-1411	1	SUCTION TUBE	
7	300-2535	1	BRACKET	
8	106-991	2	FLG LK SCREW (M8-1.25 X 20MM)	
9	106-386	2	FLG LOCKNUT (M8-1.25)	
10	115-374	36	BULK HOSE (3/4", SOLD PER 1')	USE 1 @ 36"
11	110-026	2	WORM CLAMP (1/2" TO 1-1/4")	
12	155-188	2	S/O COUPLER (24N-24H)	
13	115-040	1	NIPPLE (24N-3")	
14	115-269	1	TEE (24NF)	
15	115-045	1	STREET ELBOW (24N-24NF45)	
16	310-326	1	RISER	
17	116-588	31	BULK HOSE (1-1/2",SOLD PER FT)	USE 1 @ 27"
18	110-250	2	WORM CLAMP (1.25" TO 2.125")	
19	120-073	2	SHUT-OFF (12NF-12NF)	

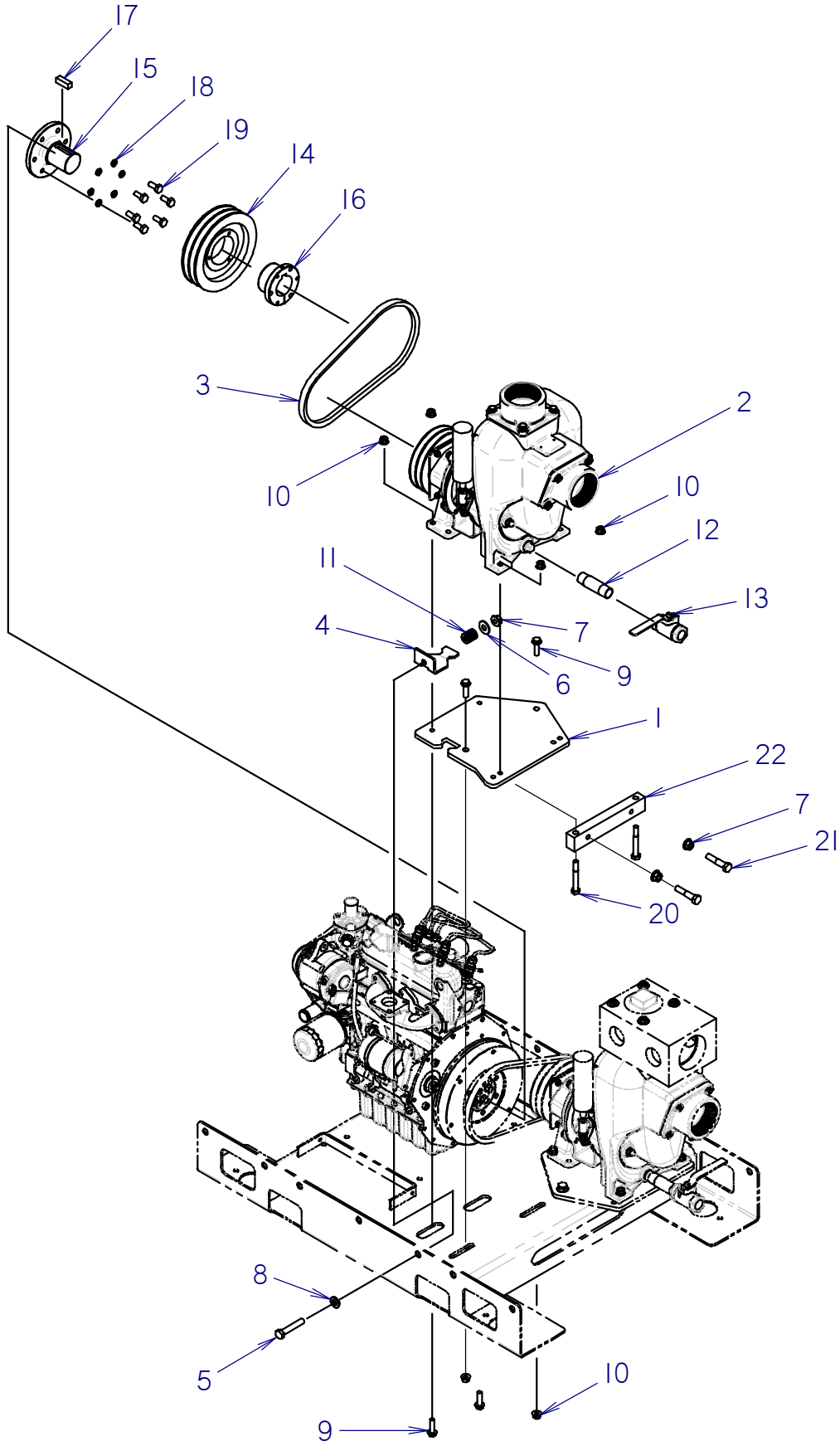
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FOOTNOTES:

NOTE:



# PUMPS



# PUMPS

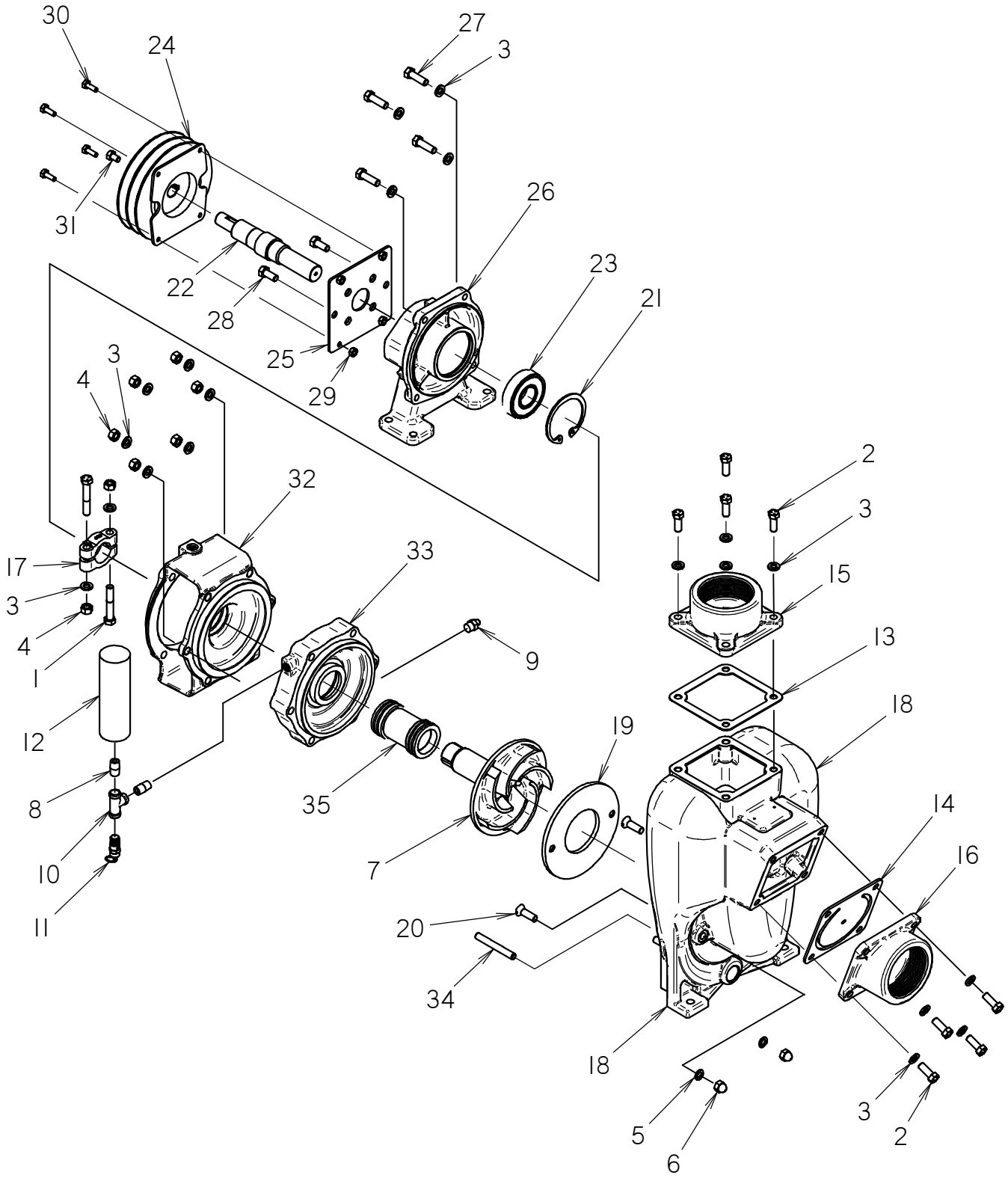
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-2973	1	PUMP MOUNT	
2	150-1850	1	CENTRIFUGAL PUMP W/ CLUTCH	
3	170-1015	1	BELT (BX35)	
4	300-2974	1	TENSIONER BRACKET	
5	106-720	1	SCREW (M12-1.75 X 70MM)	
6	105-059	1	WASHER (7/16")	
7	106-709	3	FLG LK NUT (M12-1.75)	
8	106-397	1	WASHER (M12, HARDENED)	
9	106-993	4	FLG LK SCREW (M10-1.50 X 35MM)	
10	106-387	6	FLG LOCKNUT (M10-1.50)	
11	117-979	1	SPRING	
12	114-021	1	NIPPLE (1/2N-3 1/2")	
13	120-073	2	SHUT-OFF (1/2NF-1/2NF)	
14	170-1016	1	SHEAVE (2/B-7.75")	
15	195-1081	1	ENGINE SHAFT	
16	170-277	1	SHEAVE BUSHING (2.000"-SK)	
17	165-912	1	KEY (1/2" X 1-1/2")	
18	106-090	6	LOCK WASHER (M10)	
19	111-054	6	SCREW (M10-1.25 X 25MM)	TORQUE TO 40 FT LBS
20	106-617	2	SCREW (M10-1.50 X 80MM)	
21	106-594	2	SCREW (M12-1.75 X 60MM)	
22	300-6802	1	ADJUSTMENT BAR	

NOT SHOWN:

FOOTNOTES:

NOTE:

# CENTRIFUGAL PUMP FM25



# CENTRIFUGAL PUMP

## FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	150-1850		CENTRIFUGAL PUMP	INCLUDES REF NO:S 1 THRU 35
1	105-162	2	BOLT (3/8-NC X 2-1/4")	TORQUE TO 25 FT/LBS, ALTERNATING.
2	106-136	8	BOLT (3/8-NC X 1")	
3	105-072	20	LOCK WASHER (3/8")	
4	105-053	8	NUT (3/8 NC) HEX	TORQUE TO 25 FT/LBS, ALTERNATING.
5	153-558	2	ANNULAR GASKET	
6	107-730	2	ACORN NUT (3/8-NC)	
7	310-746	1	IMPELLER (5.5")	
8	115-129	2	ALL THREAD (04N) SCH 80	
9	115-012	1	ZERK (04N)	
10	115-130	1	TEE (04NF-04NF-04NF)	
11	153-423	1	RELIEF VALVE	
12	364-555	1	GREASE RESERVOIR	
13	153-802	1	GASKET	
14	117-506	1	FLAPPER	
15	499-396	1	DISCHARGE FLANGE	
16	499-395	1	INLET FLANGE	
17	310-742	2	SHAFT CLAMP	INCLUDES REF NO:S 1, 3, & 4
18	164-022	1	PUMP CASE	
19	310-745	1	WEAR PLATE	
20	107-750	2	BOLT (3/8-NC x 1.25", CSK SLT)	
21	500-1544	1	SNAP RING	
22	500-1545	1	CLUTCH SHAFT	
23	500-1546	1	BEARING	
24	500-1547	1	CLUTCH	
25	500-1548	1	PLATE	
26	500-1549	1	FLANGE	
27	105-108	4	BOLT (3/8-NF X 1-1/4")	
28	501-122	2	BOLT (3/8-NF X 7/8")	
29	105-078	4	NUT (1/4-NC)	
30	105-865	4	BOLT (1/4-NC X 3/4", GD8)	
31	107-109	1	LK BOLT (5/16-NF X 1/2",NLK)	
32	500-2010	1	ENGINE ADAPTER	
33	164-024	1	IMPELLER HOUSING	
34	107-749	2	3/8-16 THREADED STUD	
35	191-110	1	SEAL KIT	INCLUDES REF NO. 13

## NOT SHOWN:

255-1018 AR PUMP SEAL GREASE

## FOOTNOTES:

1.

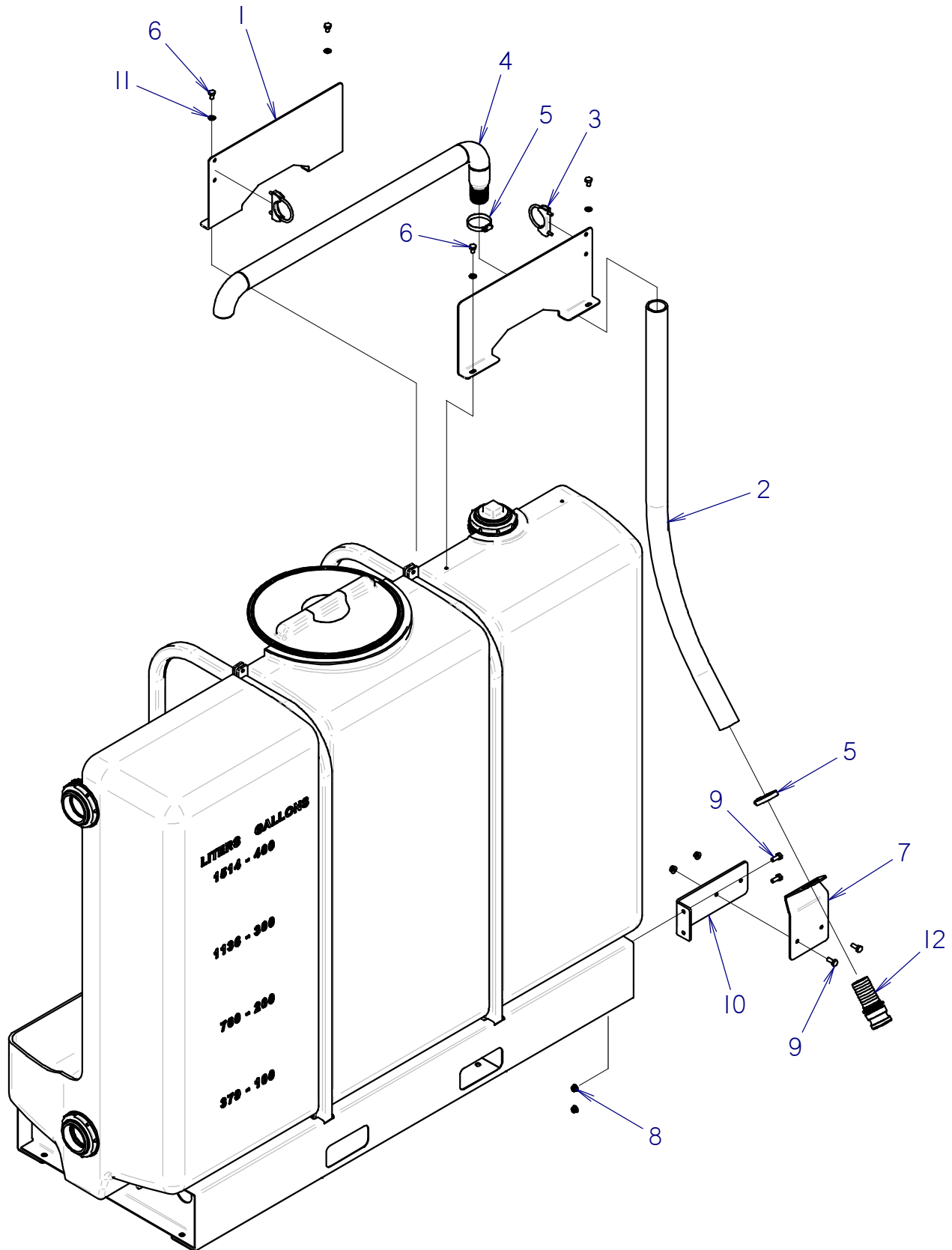
## NOTE:



# TANKS

# 500 GALLON TANK FILL PLUMBING

FM13V, FM25



# 500 GALLON TANK FILL PLUMBING

## FM13V, FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	190-1189	-	TANK FILL KIT, 500 GAL	INCLUDES REF NO'S 1-12
1	300-2752	2	MOUNTING BRACKET	
2	116-505	57	BULK HOSE (2", SOLD PER FT)	USE 1 @ 57"
3	196-009	2	U-BOLT CLAMP (2.500")	
4	300-2754	1	FILL PIPE	
5	110-134	2	WORM CLAMP (2.062" TO 2.750")	
6	106-654	4	SCREW (M10-1.50 X 16MM)	
7	300-2750	1	BRACKET	
8	106-387	4	FLG LOCKNUT (M10-1.50)	
9	105-245	4	SCREW (M10-1.50 X 25MM)	
10	315-491	1	BRACKET	
11	106-390	4	WASHER (M10)	
12	149-119	1	FHC ADAPTER (32-32H)	

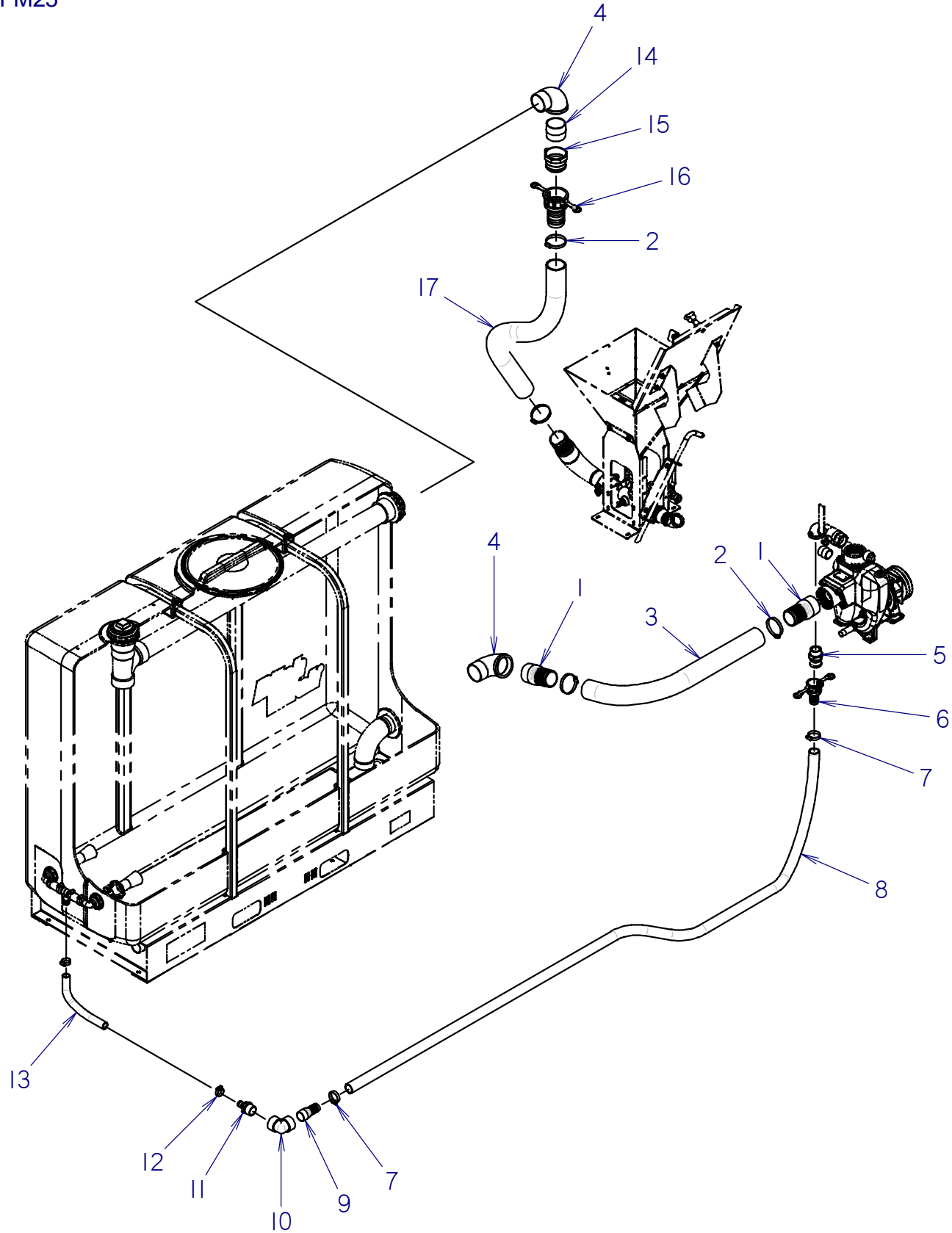
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FOOTNOTES:

NOTE:



# 500 GAL TANK PLUMBING FM25



# 500 GAL TANK PLUMBING

## FM25

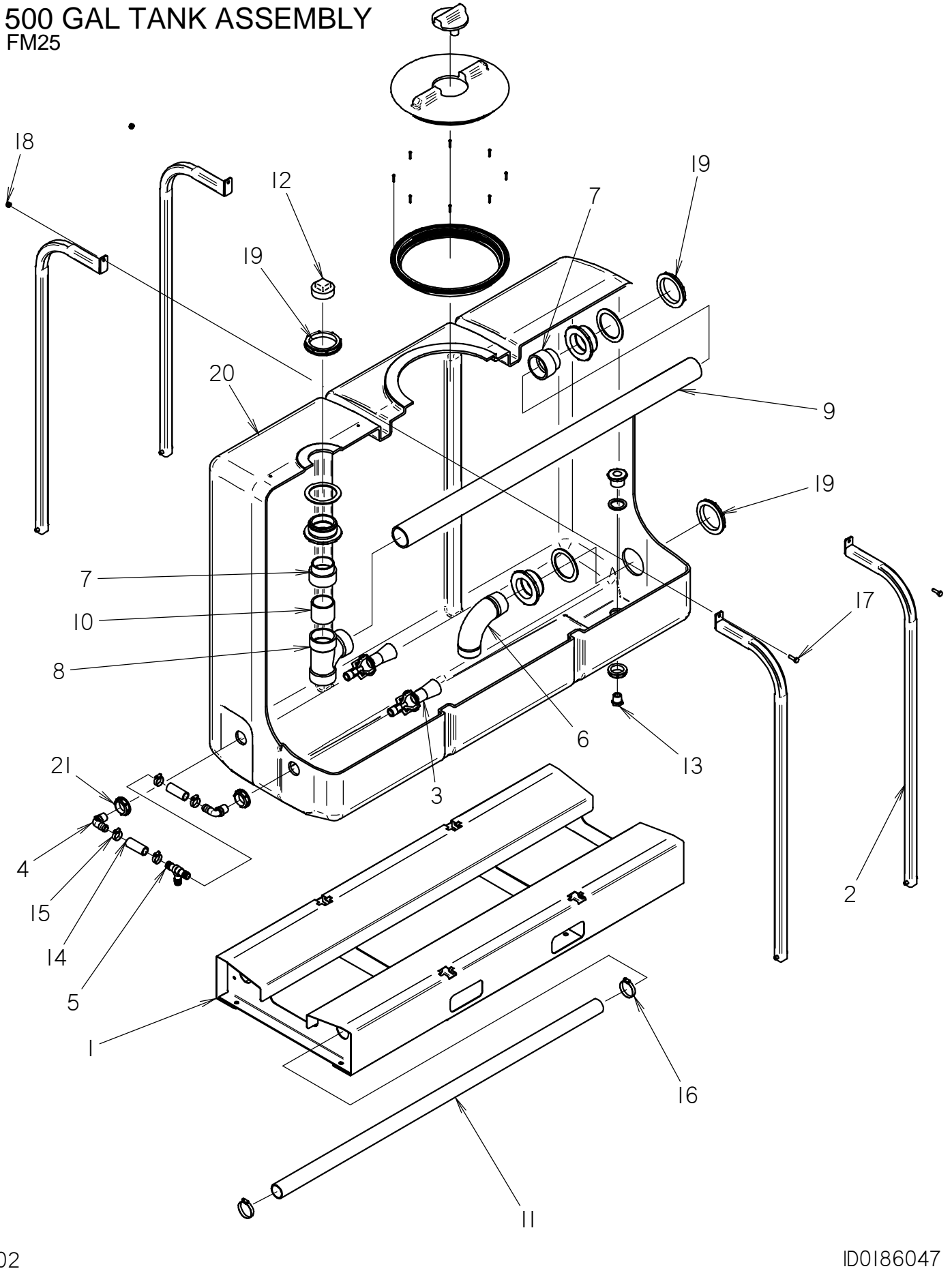
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	514-168	2	S/O ADAPTER (48N-48H)	
2	110-169	4	WORM CLAMP (2.812" TO 3.750")	
3	116-506	55	BULK HOSE (3", SOLD PER 1')	
4	114-017	2	STREET ELBOW (32N-32NF90)	
5	155-204	1	FHC ADAPTER (24-24N)	
6	155-205	1	FHC BODY (20-24H)	
7	110-250	2	WORM CLAMP (1.25" TO 2.125")	
8	116-588	198	BULK HOSE (1-1/2",SOLD PER FT)	
9	155-188	1	S/O COUPLER (24N-24H)	
10	150-1628	1	ELBOW (24NF-24NF90, POLY)	
11	150-1683	1	S/O COUPLER (24N-16H)	
12	110-353	2	WORM CLAMP (3/4" TO 1-1/2")	
13	116-094	15	BULK HOSE (1" SOLD PER 1')	
14	115-299	1	NIPPLE (48N-3")	
15	149-955	1	FHC CONNECTOR (56-48NF)	
16	155-264	1	FHC BODY (56-48H)	
17	116-506	56	BULK HOSE (3", SOLD PER 1')	

NOT SHOWN:

FOOTNOTES:

NOTE:

# 500 GAL TANK ASSEMBLY FM25



# 500 GAL TANK ASSEMBLY

## FM25

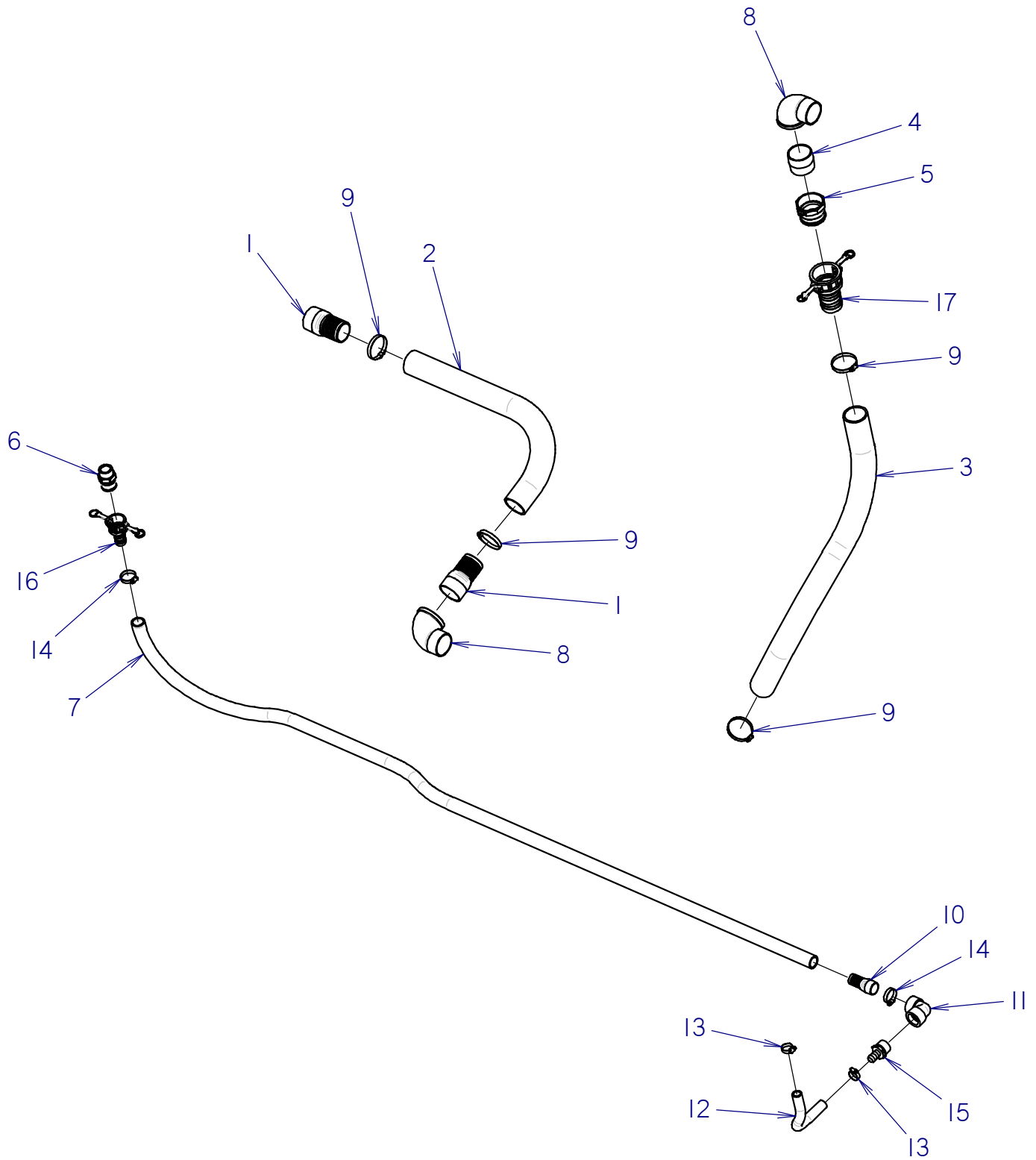
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-2575	1	TANK BASE	
2	300-2580	4	TANK SUPPORT	
3	369-810	2	MIXING JET (16N,ORF,500", NY)	
4	514-215	2	S/O COUPLER (16N-16H90)	
5	159-863	1	S/O TEE (16H-16H-16H)	
6	313-259	1	SUCTION ELBOW	
7	153-596	2	ADAPTER (48NF-48W, ABS)	
8	150-1405	1	TEE (48WF-48WF-48WF90, ABS)	
9	314-882	1	PIPE (-48 X 63.5" ABS)	
10	315-489	1	PIPE (-48 X 3.00", ABS)	
11	300-2784	1	PIPE 2" PVC .154"W X 69.5"	
12	156-939	1	PLUG (48N)	
13	153-721	1	PLUG (16N POLY)	
14	116-094	5	BULK HOSE (1", SOLD PER 1')	2 @ 25"
15	110-353	4	WORM CLAMP (3/4" TO 1-1/2")	
16	110-134	2	WORM CLAMP (2.062" TO 2.750")	
17	105-876	2	SCREW (M10-1.50 X 35MM)	
18	106-758	2	LOCKNUT (M10-1.5)	
19	153-549	3	BK CONNECTOR (48NF-48NF, NYL)	
20	364-1001	1	STORAGE TANK (500 GAL)	
21	157-490	3	BK CONNECTOR (16NF POLY)	

NOT SHOWN:

FOOTNOTES:

NOTE:

# 500 GAL HOSE KIT FM25



# 500 GAL HOSE KIT

## FM25

REF PART  
NO. NUMBER QTY DESCRIPTION REMARKS

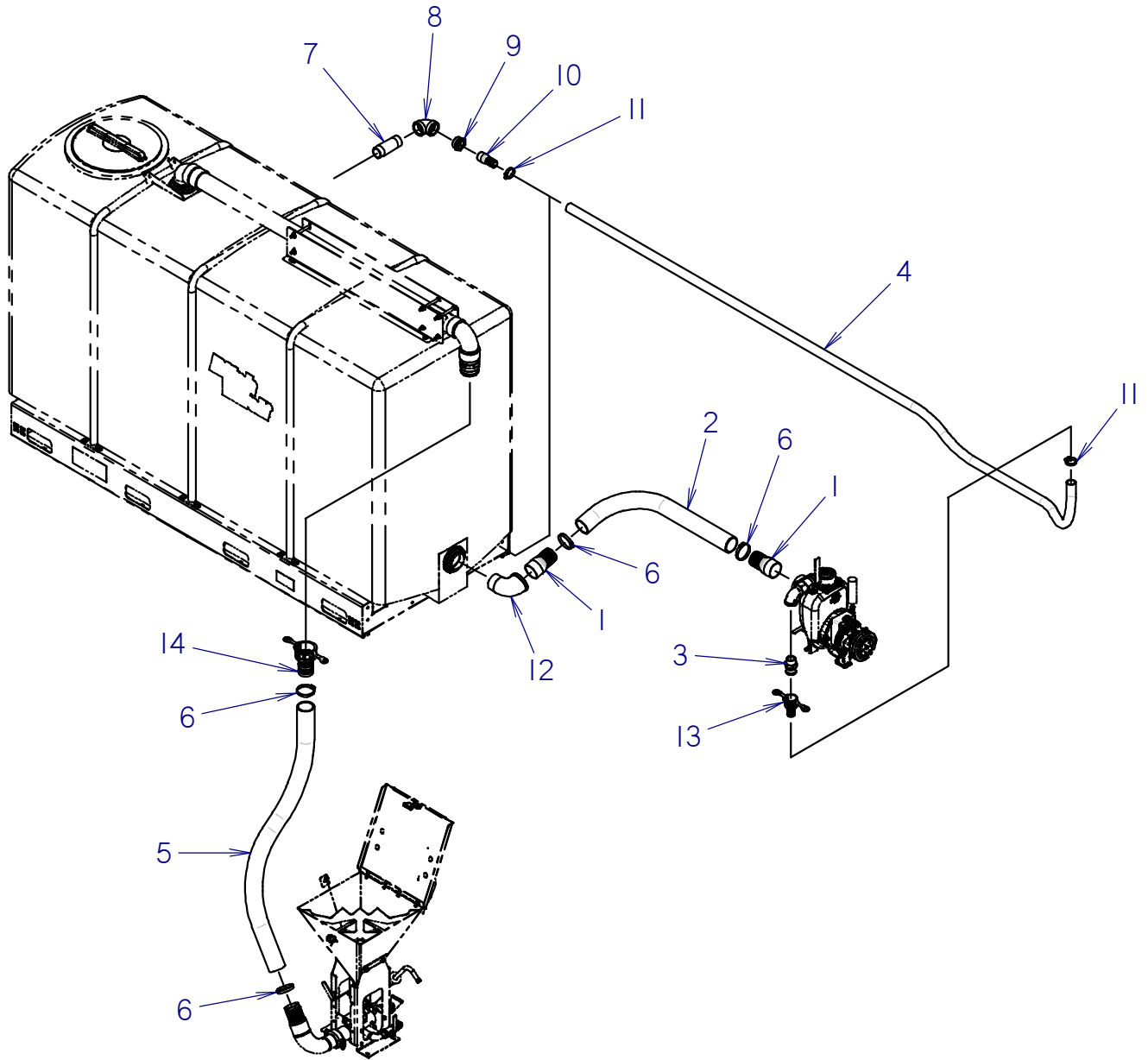
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	514-168	2	S/O ADAPTER (48N-48H)	
2	116-506	55	BULK HOSE (3", SOLD PER 1')	
3	116-506	56	BULK HOSE (3", SOLD PER 1')	
4	115-299	1	NIPPLE (48N-3")	
5	149-955	1	FHC CONNECTOR (56-48NF)	
6	155-204	1	FHC ADAPTER (24-24N)	
7	116-588	198	BULK HOSE (1-1/2",SOLD PER FT)	
8	114-017	2	STREET ELBOW (32N-32NF90)	
9	110-169	4	WORM CLAMP (2.812" TO 3.750")	
10	155-188	1	S/O COUPLER (24N-24H)	
11	150-1628	1	ELBOW (24NF-24NF90, POLY)	
12	116-094	15	BULK HOSE (1" SOLD PER 1')	
13	110-353	2	WORM CLAMP (3/4" TO 1-1/2")	
14	110-250	2	WORM CLAMP (1.25" TO 2.125")	
15	150-1683	1	S/O COUPLER (24N-16H)	
16	155-205	1	FHC BODY (20-24H)	
17	155-264	1	FHC BODY (56-48H)	

NOT SHOWN:

FOOTNOTES:

NOTE:

# 1000 GAL TANK PLUMBING FM25



# 1000 GAL TANK PLUMBING

## FM25

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	514-168	2	S/O ADAPTER (48N-48H)	
2	116-506	55	BULK HOSE (3", SOLD PER 1')	
3	155-204	1	FHC ADAPTER (24-24N)	
4	116-588	198	BULK HOSE (1-1/2",SOLD PER FT)	
5	116-506	55	BULK HOSE (3", SOLD PER 1')	
6	110-169	4	WORM CLAMP (2.812" TO 3.750")	
7	115-185	1	NIPPLE (32N-6")	
8	115-293	1	ELBOW (32NF-32NF90)	
9	115-087	1	REDUCER (32N - 24NF)	
10	155-188	1	S/O COUPLER (24N-24H)	
11	110-250	2	WORM CLAMP (1.25" TO 2.125")	
12	114-017	1	STREET ELBOW (32N-32NF90)	
13	155-205	1	FHC BODY (20-24H)	
14	155-264	1	FHC BODY (56-48H)	

NOT SHOWN:

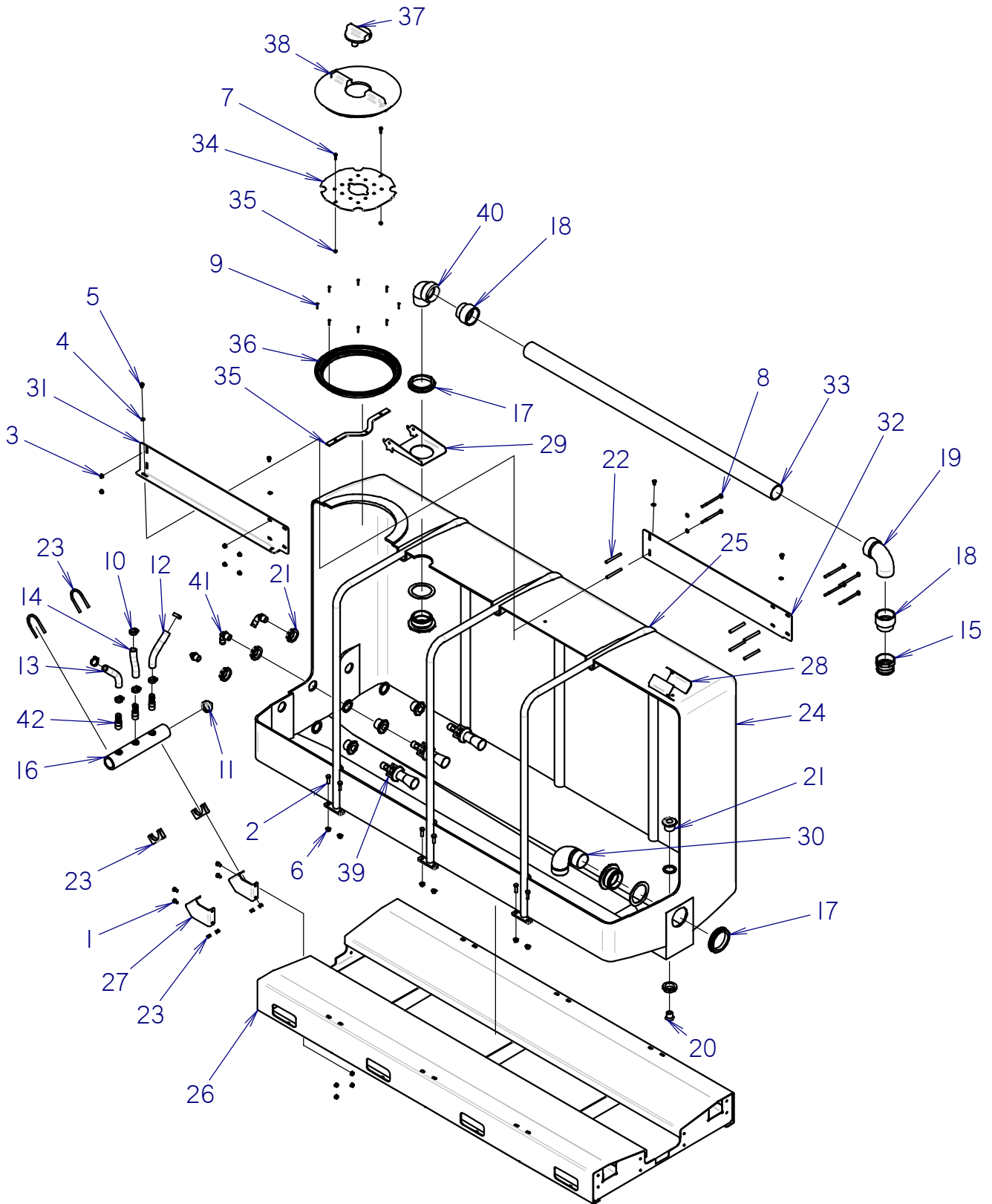
FOOTNOTES:

NOTE:



# 1000 GAL TANK ASSEMBLY

FM13V, FM25



# 1000 GAL TANK ASSEMBLY

## FM13V, FM25

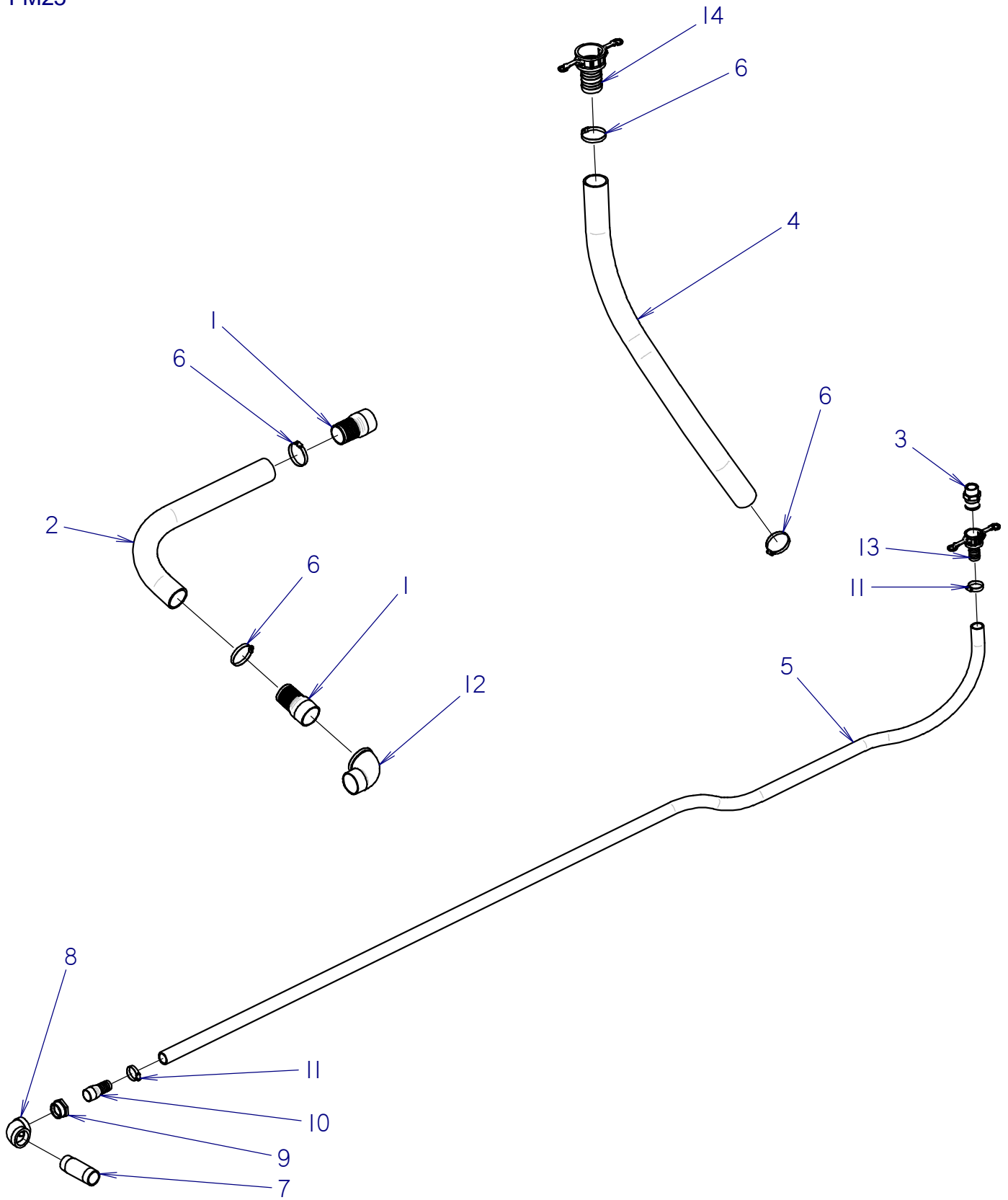
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	105-274	4	SCREW (M10-1.50 X 20MM, 10.9)	
2	106-333	12	SCREW (M12-1.75 X 40MM, 8.8)	
3	106-387	10	FLG LOCKNUT (M10-1.50)	
4	106-390	6	WASHER (M10)	
5	106-654	4	SCREW (M10-1.50 X 16MM)	
6	106-709	12	FLG LK NUT (M12-1.75)	
7	107-240	2	LK BOLT (5/16-NC X 1", NLK)	
8	107-420	6	SCREW (M10-1.50 X 140MM)	
9	108-072	8	SCREW (#10-16 X 1.25", PAN PLPS)	
10	110-353	6	WORM CLAMP (3/4" TO 1-1/2")	
11	114-008	1	PLUG (32N, SQ, GALV)	
12	116-094	9	BULK HOSE (1", SOLD PER 1")	
13	116-094	9	BULK HOSE (1", SOLD PER 1")	
14	116-094	7	BULK HOSE (1", SOLD PER 1")	
15	149-955	1	FHC CONNECTOR (56-48NF)	
16	149-971	1	MANIFOLD	
17	153-549	2	BK CONNECTOR (48NF-48NF, NYL)	
18	153-596	2	ADAPTER (48NF-48W, ABS)	
19	153-635	1	ST ELBOW, (48W-48WF90, ABS)	
20	153-721	1	PLUG (16N POLY)	
21	157-490	4	BK CONNECTOR (16NF POLY)	
22	178-858	6	3/8" SPACER BUSHING	
23	196-010	2	U-BOLT CLAMP (3")	
24	305-805	1	TANK (POLYETHYLENE, 1000 GAL)	SEE FOOTNOTE 1
25	305-868	3	TANK STRAP	
26	305-875	1	TANK BASE	
27	308-751	2	MOUNTING BRACKET	
28	309-608	2	BRACKE, PIPE SUPPORT	
29	310-602	1	MOUNTING BRACKET	
30	313-259	1	SUCTION ELBOW	
31	313-262	1	VENTURI MOUNT, LH	
32	313-265	1	VENTURI MOUNT, LH	
33	314-381	1	PIPE (-48 X 73.75" ABS)	
34	323-114	1	BAFFLE	
35	323-152	1	RETAINER	
36	357-261	1	FILLWELL (16")	
37	357-263	1	TANK CAP (4")	
38	364-434	1	TANK CAP (16", VENTED)	
39	369-810	3	MIXING JET (16N,ORF.500", NY)	
40	514-210	1	ST ELBOW, POLY (48NM-48NF90)	
41	514-215	3	S/O COUPLER (16N-16H90)	
42	514-311	3	S/O COUPLER (16N-16H)	

**FOOTNOTES:**

1. INCLUDES REFERENCE NUMBERS 9, 36, 37, & 38

**NOTE:**

# 1000 GAL HOSE KIT FM25



# 1000 GAL HOSE KIT

## FM25

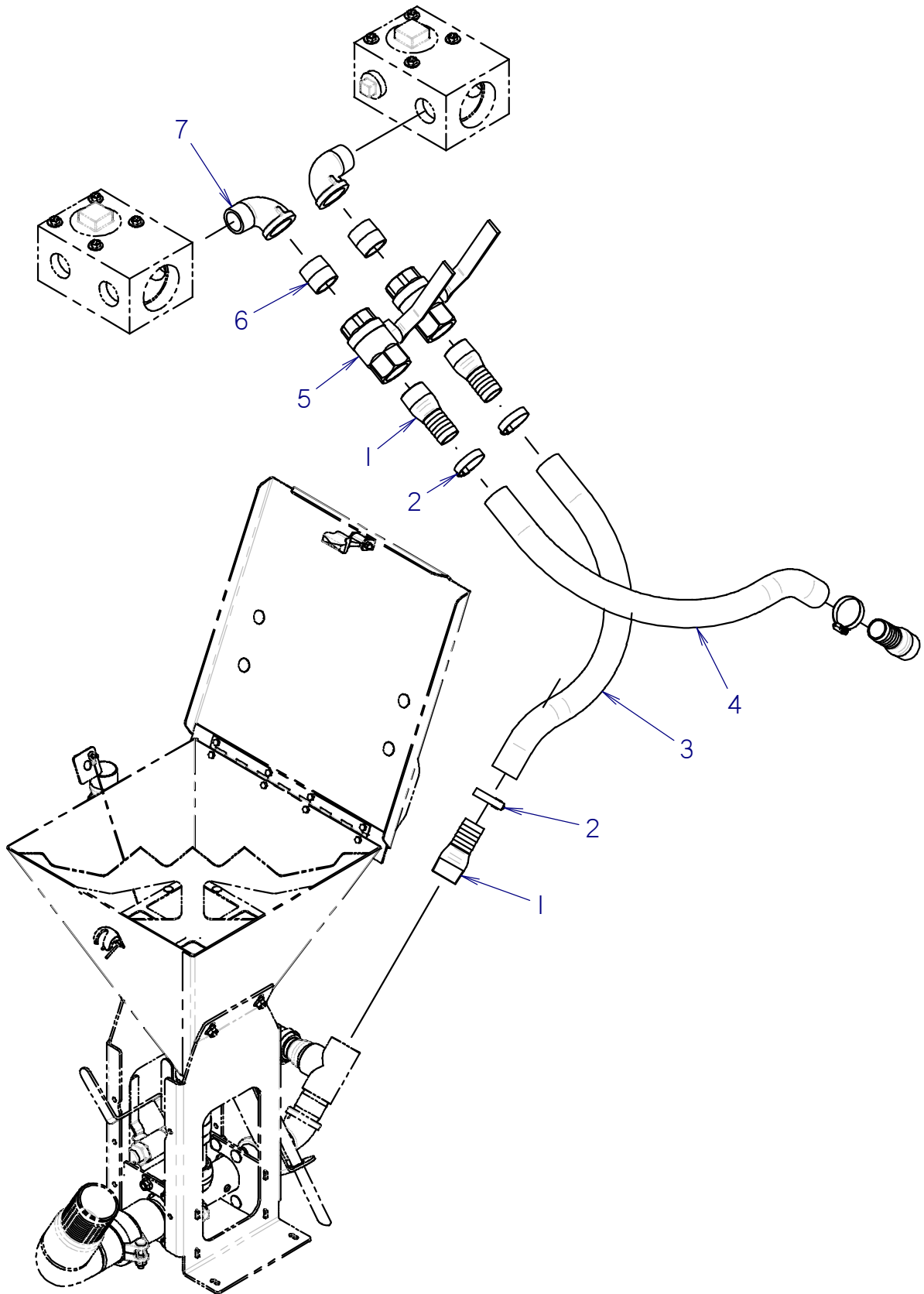
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	514-168	2	S/O ADAPTER (48N-48H)	
2	116-506	55	BULK HOSE (3", SOLD PER 1')	
3	155-204	1	FHC ADAPTER (24-24N)	
4	116-506	55	BULK HOSE (3", SOLD PER 1')	
5	116-588	198	BULK HOSE (1-1/2",SOLD PER FT)	
6	110-169	4	WORM CLAMP (2.812" TO 3.750")	
7	115-185	1	NIPPLE (32N-6")	
8	115-293	1	ELBOW (32NF-32NF90)	
9	115-087	1	REDUCER (32N - 24NF)	
10	155-188	1	S/O COUPLER (24N-24H)	
11	110-250	2	WORM CLAMP (1.25" TO 2.125")	
12	114-017	1	STREET ELBOW (32N-32NF90)	
13	155-205	1	FHC BODY (20-24H)	
14	155-264	1	FHC BODY (56-48H)	

NOT SHOWN:

FOOTNOTES:

NOTE:

# TRANSFER HOSE



# TRANSFER HOSE

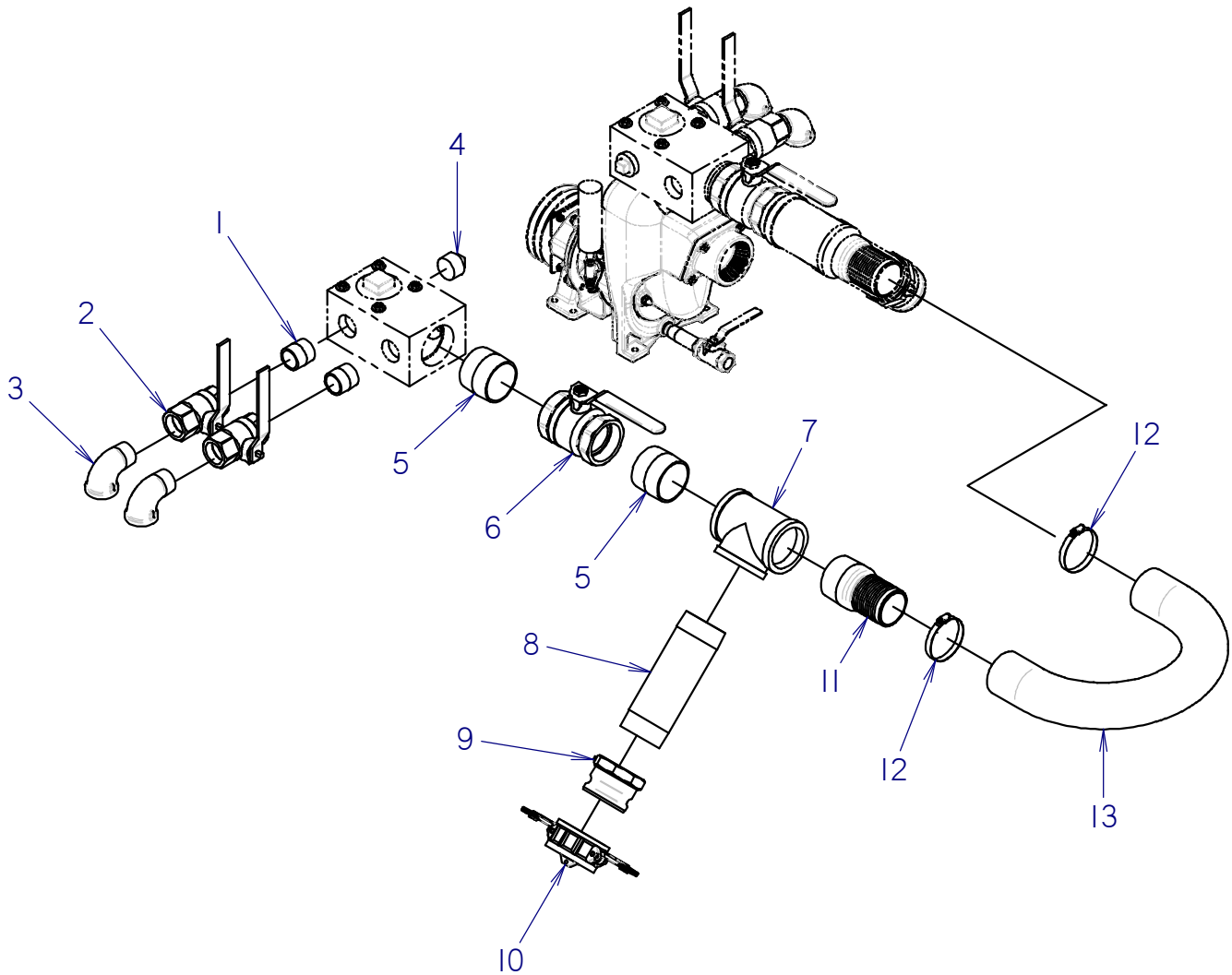
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	155-188	4	S/O COUPLER (24N-24H)	
2	110-250	4	WORM CLAMP (1.25" TO 2.125")	
3	116-588	31	BULK HOSE (1-1/2";SOLD PER FT)	
4	116-588	31	BULK HOSE (1-1/2";SOLD PER FT)	
5	159-790	2	SHUT-OFF (24NF-24NF)	
6	115-263	2	ALL THREAD (24N)	
7	114-031	2	STREET ELBOW (24N-24NF90)	

NOT SHOWN:

FOOTNOTES:

NOTE:

## MANIFOLD KIT



# MANIFOLD KIT

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	115-263	4	ALL THREAD (24N)	
2	159-790	4	SHUT-OFF (24NF-24NF)	
3	114-031	4	STREET ELBOW (24N-24NF90)	
4	115-259	2	PLUG (24N, SQ)	
5	115-299	4	NIPPLE (48N-3")	
6	120-060	2	SHUT-OFF (48NF-48NF)	
7	154-485	2	TEE (48NF-48NF-48NF)	
8	153-446	2	NIPPLE (48N-10")	
9	149-955	2	FHC CONNECTOR (56-48NF)	
10	015-728	1	FHC CAP (48)	
11	514-168	2	S/O ADAPTER (48N-48H)	
12	110-169	2	WORM CLAMP (2.812" TO 3.750")	
13	116-506	42	BULK HOSE (3", SOLD PER 1')	

NOT SHOWN:

FOOTNOTES:

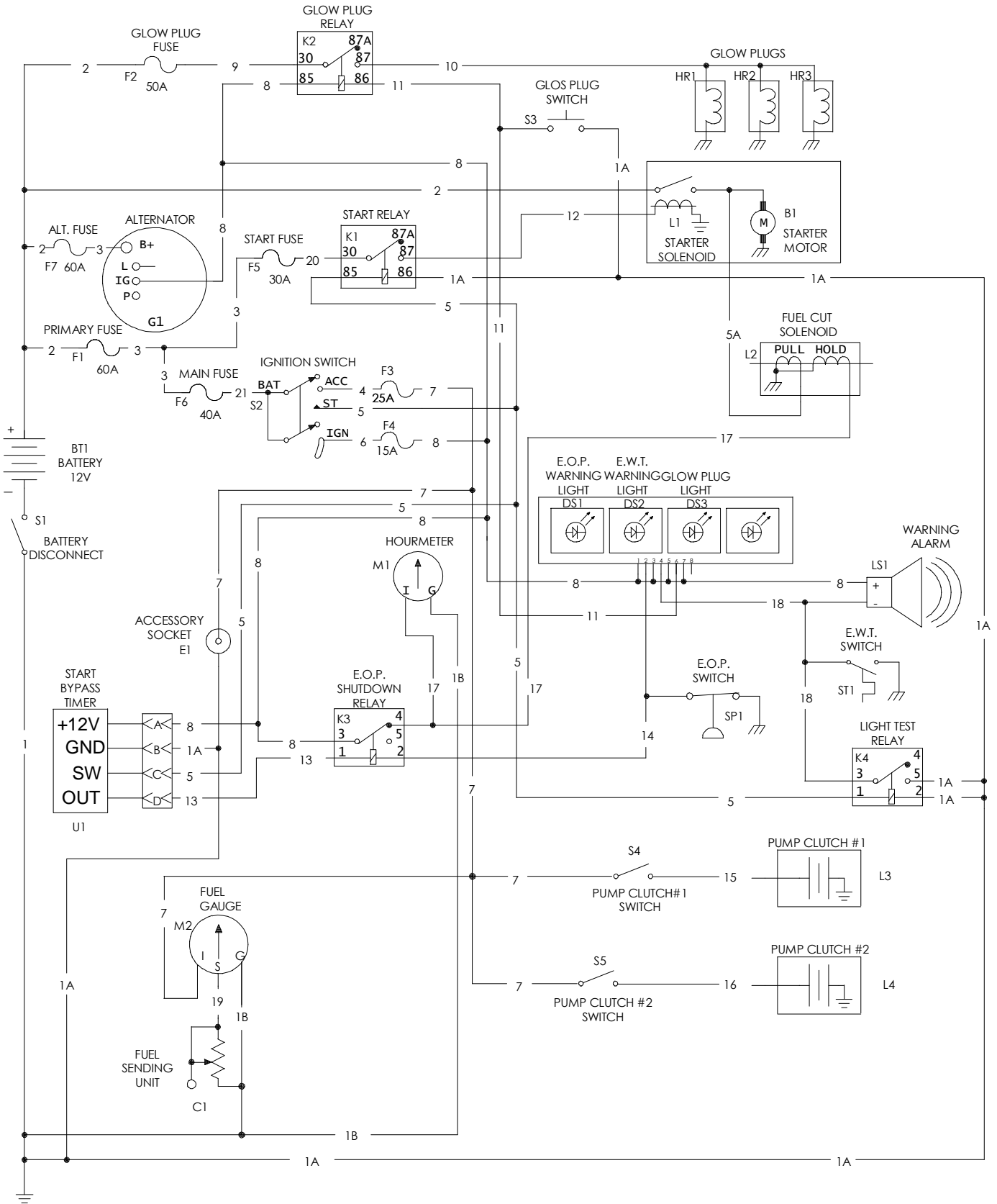
NOTE:





# **ELECTRICAL**

# ELECTRICAL SCHEMATIC FM25



# ELECTRICAL SCHEMATIC

FM25

## CIRCUIT DESCRIPTION

Circuit	Wire Color	Function
1	blk	High current ground
1A	blk/red	Medium current ground
1B	blk/blu	Low current ground
2	red	Battery circuit
3	red	Fused battery circuit
4	org/brn	Accessory circuit
5	wht/blk	Start circuit
5A	wht	Starter solenoid to pull circuit of fuel solenoid
6	org/blu	Ignition circuit
7	org	Fused accessory circuit
8	org/grn	Fused ignition circuit
9	red/blu	Glow plug fuse to glow plug relay
10	pur	Glow plug relay to glow plug bus bar
11	blk/yel	Glow plug switch to glow plug relay
12	pur	Start relay to starter solenoid
13	blu/wht	Start bypass timer to EOP shutdown relay
14	wht/blu	EOP switch to EOP warning light & EOP shutdown relay
15	blu	Wash "Pump Clutch "to " Pump Clutch Switch #1"
16	blu/wht	Wash "Pump Clutch "to " Pump Clutch Switch #2"
17	org/gra	Jumper plug to hour meter & hold circuit of fuel solenoid
18	blu/yel	D1 & D2 anodes to warning alarm ground circuit
19	tan	"Fuel Level Sending Unit" to "S" on Fuel Level Gauge
20	red/wht	starter fuse to start relay
21	red/blk	main fuse to Ignition switch

# ELECTRICAL SCHEMATIC

FM25

## COMPONENT DESCRIPTION

Ref. Number	Part Number	Component	Notes
B1	194-873	Starter	12volt 1.4kw with lead wire
BT1	215-258	Battery	12volt, 800CCA
C1	214-844	Fuel Sending Unit	
DS1	See notes	Engine oil pressure light	Part of 220-664
DS2	See notes	Engine water temperature light	
DS3	See notes	Glow plug light	
E1	214-301	Accessory socket	12V 5A
F1	211-310	Primary fuse	60A AMI
F2	211-317	Glow plug fuse	50A AMI
F3	217-811	Accessory fuse	15A ATC
F4	217-811	Ignition fuse	15A ATC
F5	217-813	Start fuse	30A ATC
F6	211-303	Main fuse	40A ATC
F7	211-310	Alternator fuse	60A AMI
G1	213-365	Alternator	12V 40A
HR1	194-383	Glow plug	
HR2	194-383	Glow plug	
HR3	194-383	Glow plug	
K1	217-826	Start relay	Mini relay (spdt)
K2	217-826	Glow plug relay	Mini relay (spdt)
K3	217-710	EOP shutdown relay	Micro relay (spdt)
K4	217-710	Light test relay	Micro relay (spdt)
L1	See notes	Starter solenoid	Starter component
L2	217-953	Fuel stop solenoid	Engine component (energize to run)
L3	500-1547	Pump Clutch #1	
L4	500-1547	Pump Clutch #2	
LS1	306-603	Audio warning alarm	
M1	215-128	Hour meter	
M2	215-133	Fuel Gauge	
S1	217-833	Battery disconnect	EU-Standard, U.S. Option
S2	214-852	Ignition switch	14V, 50A uses P/N 214-961 keys
S3	306-607	Glow plug switch Cover# 306-608	Momentary push button
S4	214-647	Pump Clutch Switch #1	
S5	214-647	Pump Clutch Switch #2	
SP1	217-952	Engine oil pressure switch	Normally closed, opens 7PSI grounds through body
ST1	213-338	Engine water temperature switch	Normally open, closes @ 230°F
U1	217-937	Start bypass timer	

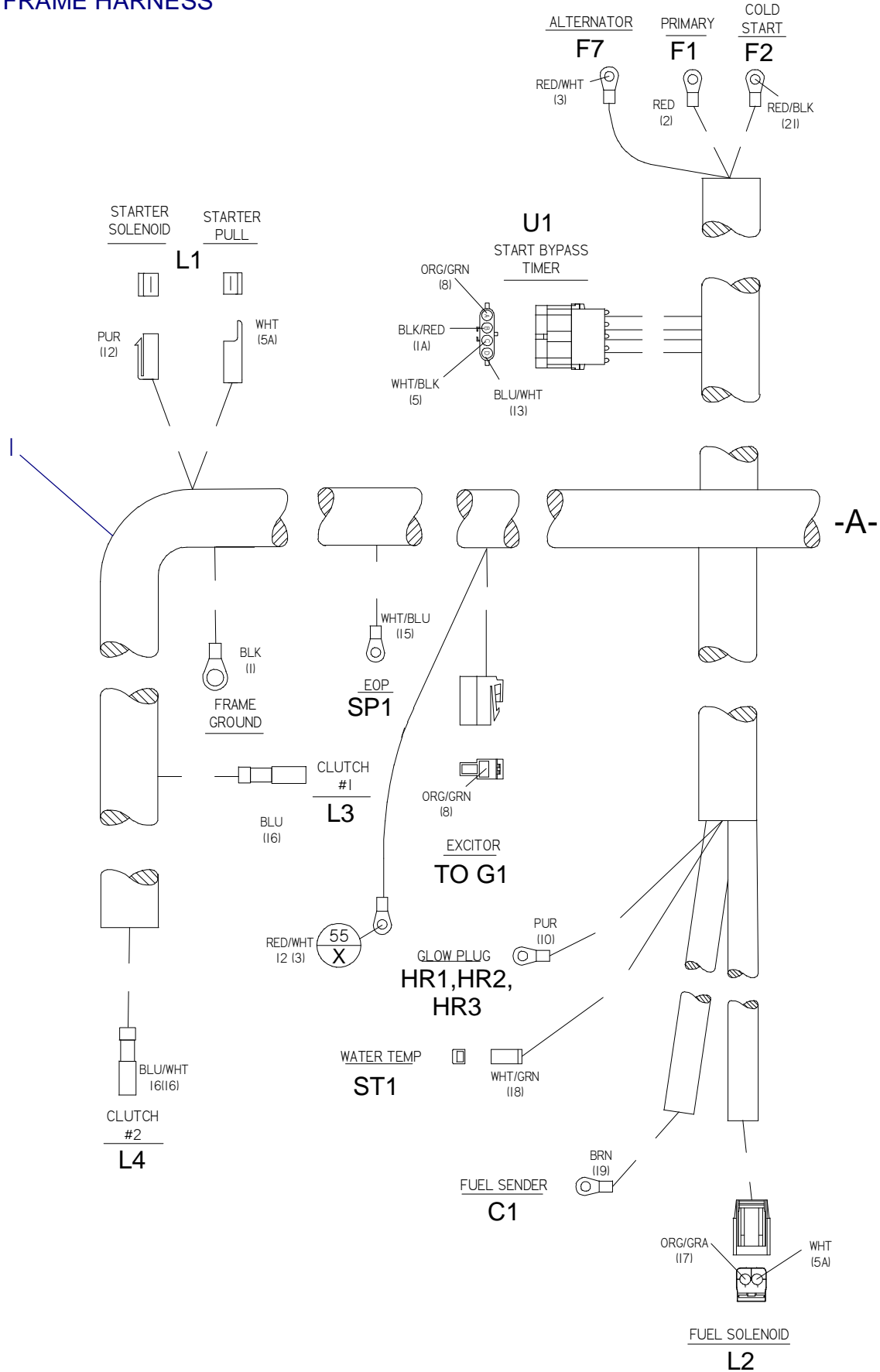
# ELECTRICAL SCHEMATIC

FM25

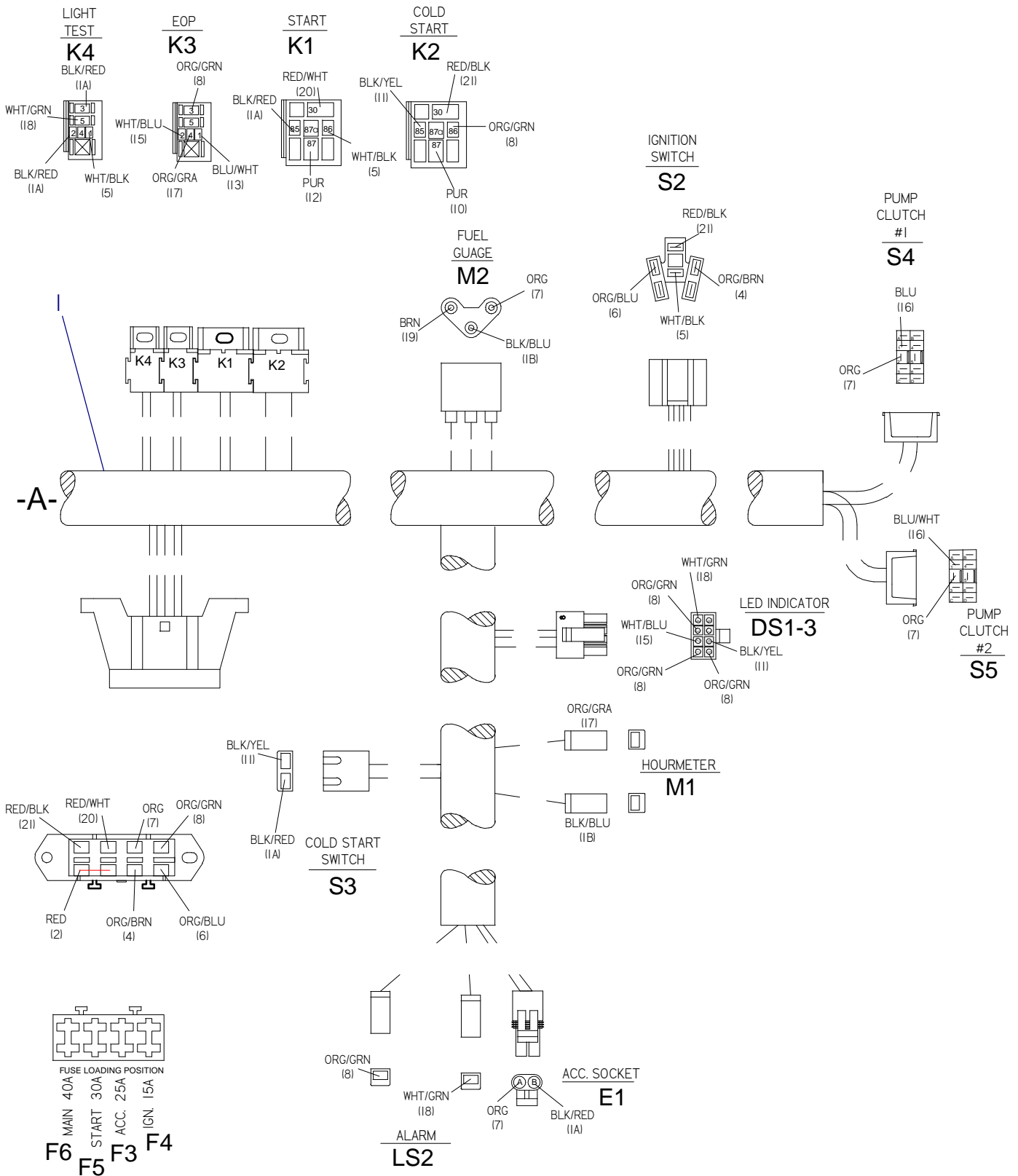
WIRING HARNESSES

Ref. Number	Part Number	Quantity	Description
1	215-1176	1	FM25 Frame Harness
2	215-303	1	Battery cable (Red)
3	215-305	1	Battery cable (Black)
4	215-307	1	Battery cable (Black)

# ELECTRICAL DIAGRAM FM25 FRAME HARNESS



# ELECTRICAL DIAGRAM FM25 FRAME HARNESS





# ELECTRICAL DIAGRAM

## FM25 FRAME HARNESS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
I	215-1176	I	FM25 FRAME HARNESS	

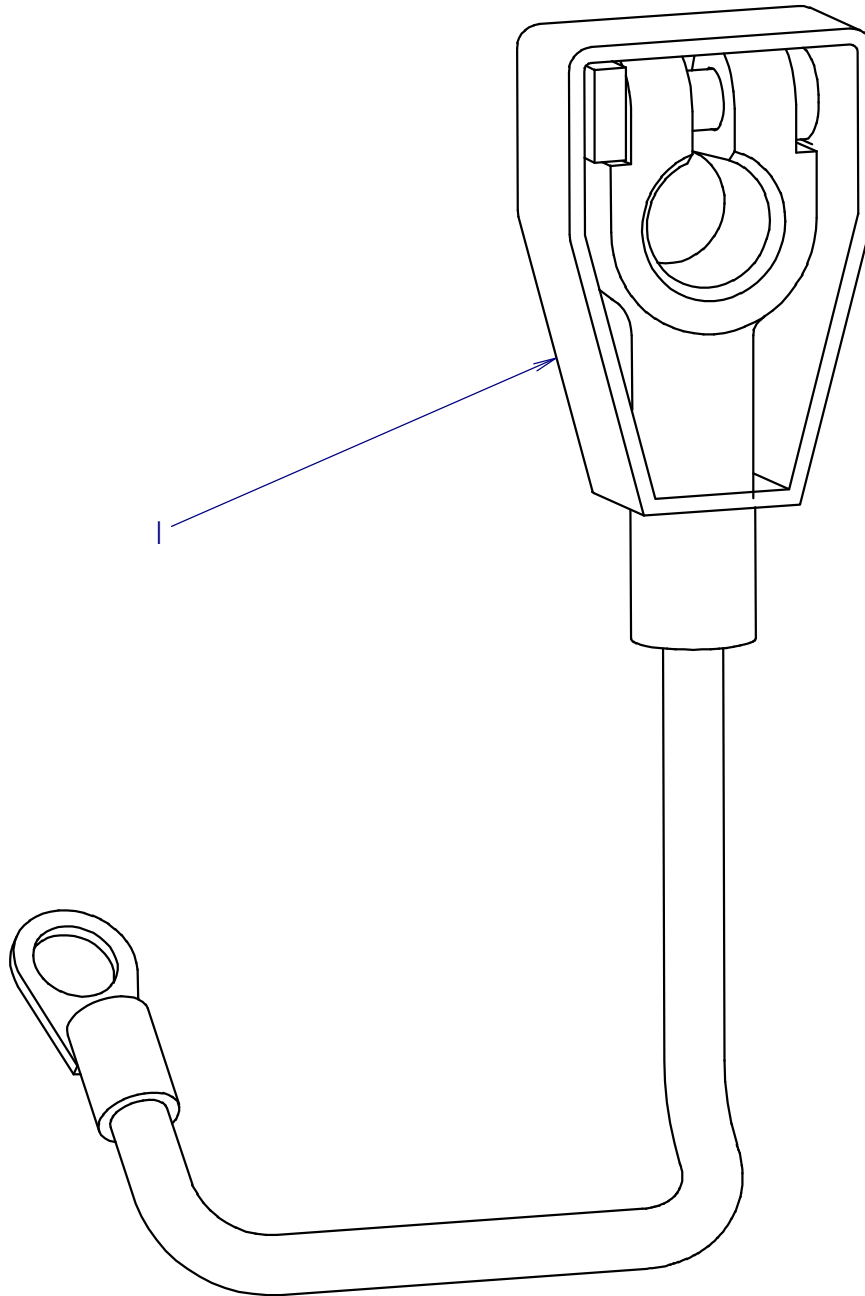
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FOOTNOTES:

NOTE:



**ELECTRICAL DIAGRAM**  
BATTERY CABLE (4 GA. X 10", RED)



# ELECTRICAL DIAGRAM

## BATTERY CABLE (4 GA. X 10", RED)

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	215-303	1	BATTERY CABLE (4 GA. X 10", RED)	

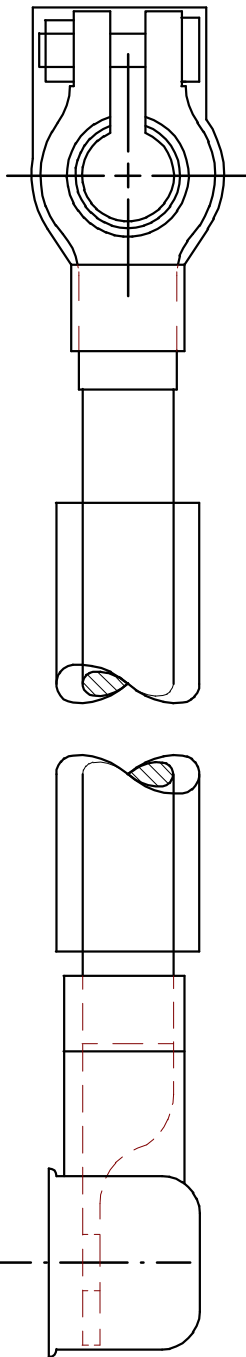
NOT SHOWN:

FOOTNOTES:

NOTE:

**ELECTRICAL DIAGRAM**  
BATTERY CABLE (4GA. X 38", RED)

BT1  
TO BATTERY POSITIVE



TO STARTER MOTOR SOLENOID

B1

# ELECTRICAL DIAGRAM

## BATTERY CABLE (4GA. X 38", RED)

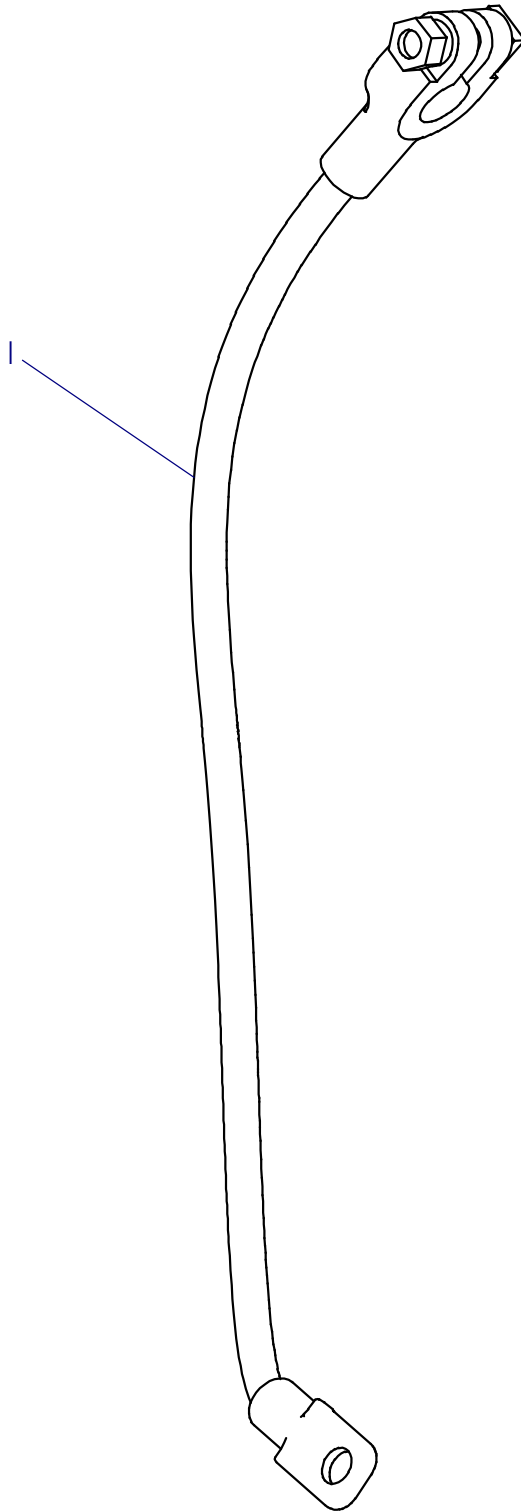
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
I.	215-308	1	BATTERY CABLE (4GA. X 38", RED)	

NOT SHOWN:

FOOTNOTES:

NOTE:

**ELECTRICAL DIAGRAM**  
BATTERY CABLE 20" (BLK)



# ELECTRICAL DIAGRAM

## BATTERY CABLE 20" (BLK)

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	215-307	1	BATTERY CABLE (4GA X 20", BLACK)	

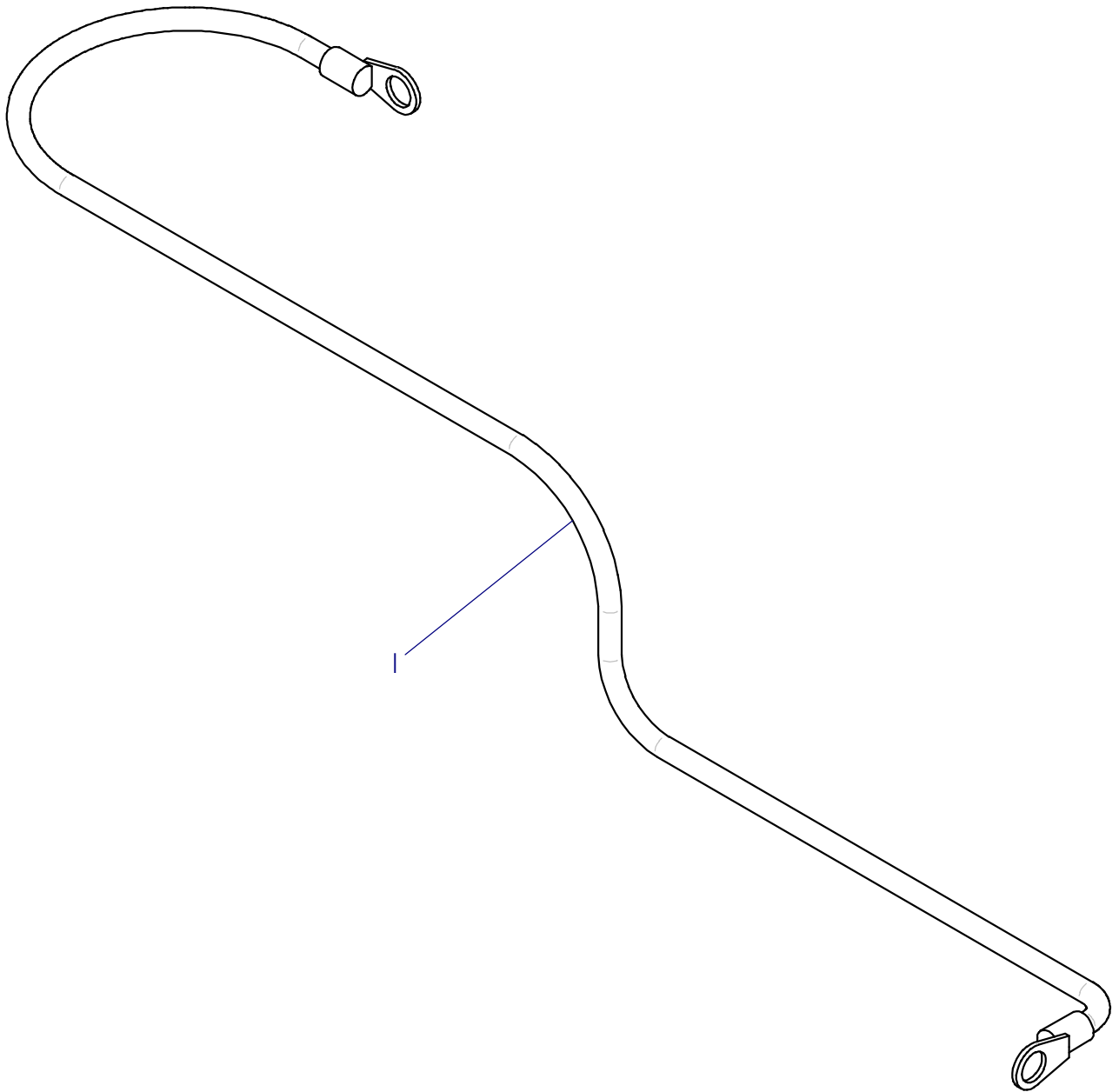
NOT SHOWN:

FOOTNOTES:

NOTE:



**ELECTRICAL DIAGRAM**  
BATTERY CABLE (4 GA. X 30", BLK)



# ELECTRICAL DIAGRAM

## BATTERY CABLE (4 GA. X 30", BLK)

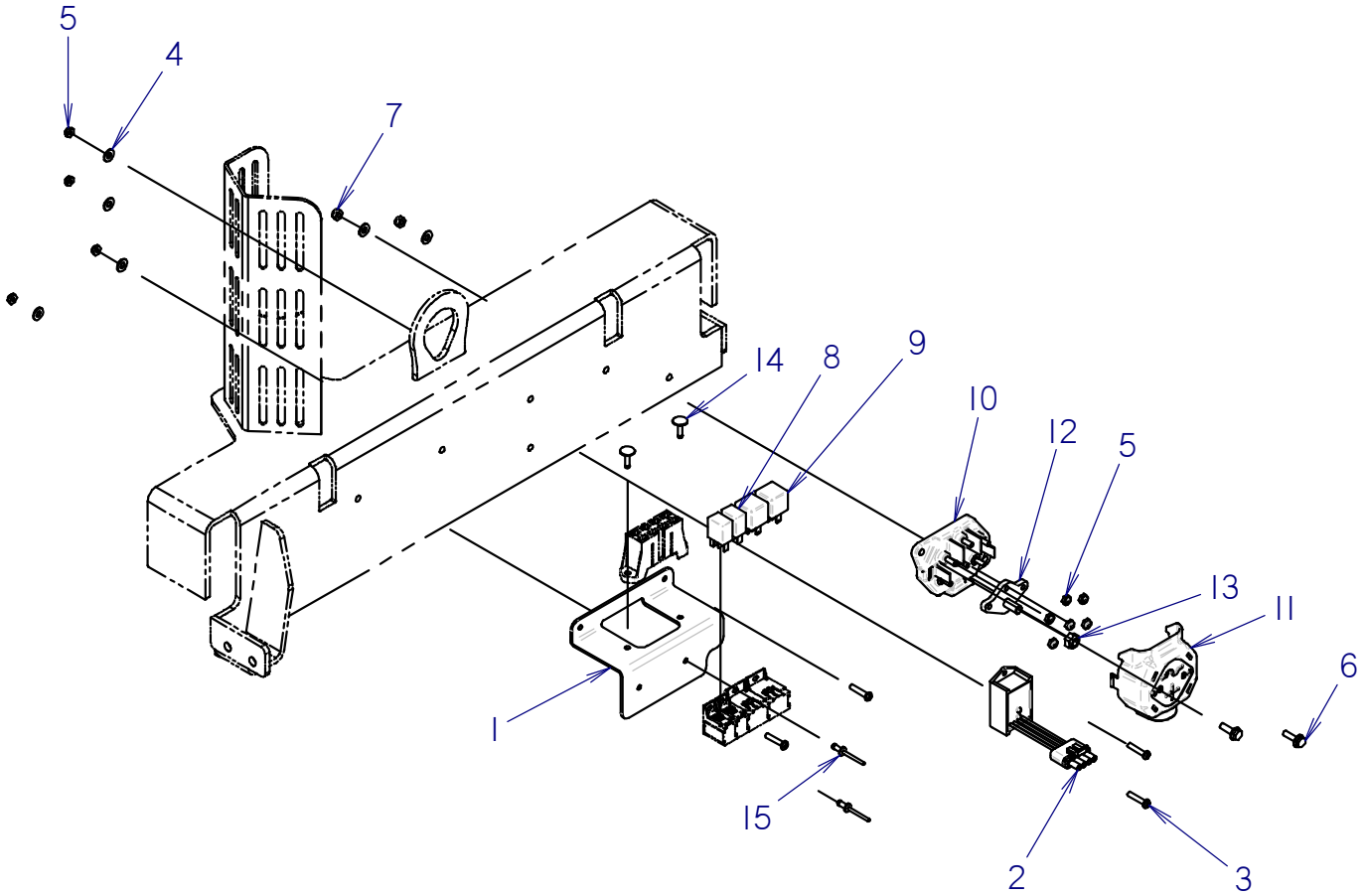
REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	215-305	1	BATTERY CABLE (4 GA. X 30", BLK)	

NOT SHOWN:

FOOTNOTES:

NOTE:

# ELECTRICAL



# ELECTRICAL

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1	300-4696	1	RELAY & FUSE BRACKET	
2	217-937	1	START BYPASS DELAY TIMER	
3	105-815	4	BOLT (#10-24 UNC X 1" PAN SLT)	
4	105-284	6	WASHER (3/16")	
5	106-048	10	LOCKNUT (#10-24)	
6	106-161	2	FLG SCREW (M6-1.00 X 20MM)	
7	106-237	2	LOCKNUT (M6-1.00,PRV TRQ,NLK)	
8	217-710	2	MICRO RELAY (SPDT)	
9	217-826	2	MINI RELAY (SPDT)	
10	215-1009	1	MAIN FUSE HOLDER BASE	
11	215-1010	1	MAIN FUSE HOLDER COVER	
12	215-1011	1	BUSSBAR (MAIN FUSE HOLDER)	
13	105-047	1	LOCKNUT (3/8-NC)	
14	110-348	2	POP RIVET (3/16" X .664")	
15	110-253	2	POP RIVET (3/16" X 1/2")	

NOT SHOWN:

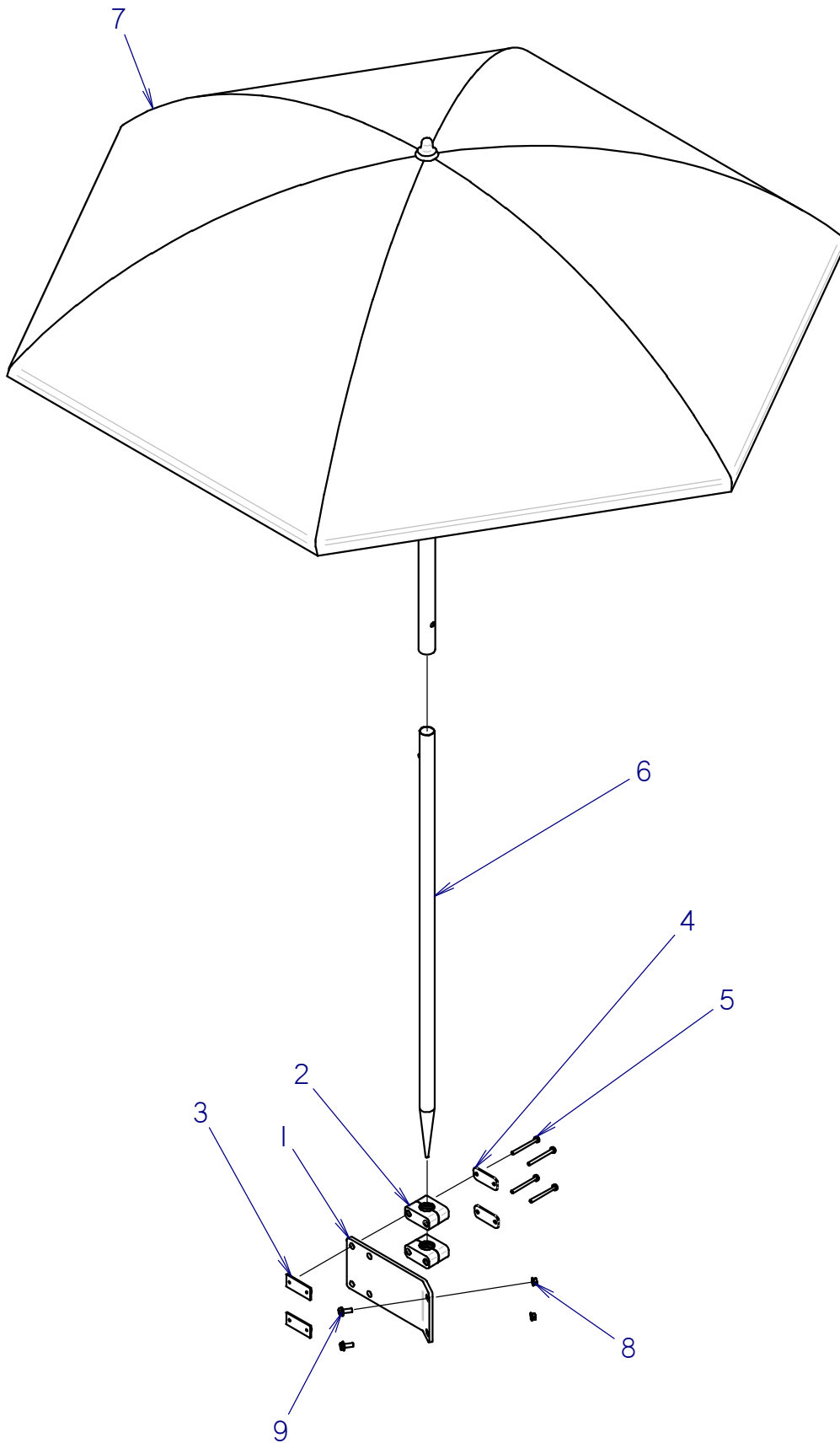
FOOTNOTES:

NOTE:

<b>NOTES:</b>

# ACCESSORIES

# UMBRELLA KIT



# UMBRELLA KIT

REF PART  
NO. NUMBER QTY DESCRIPTION REMARKS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	190-1306		UMBRELLA KIT	
1	300-6927	1	BRACKET	
2	111-026	2	BOLT-ON CLAMP (1-1/4", PAIR)	
3	322-363	2	WELD PLATE	
4	322-362	2	BACKUP SPACER	
5	106-967	4	BOLT (1/4-NC X 2-3/4", SIL BRZ)	
6	308-652	1	UMBRELLA POLE	
7	344-700	1	UMBRELLA	
8	106-386	2	FLG LOCKNUT (M8-1.25)	
9	106-991	2	FLG LK SCREW (M8-1.25 X 20MM)	

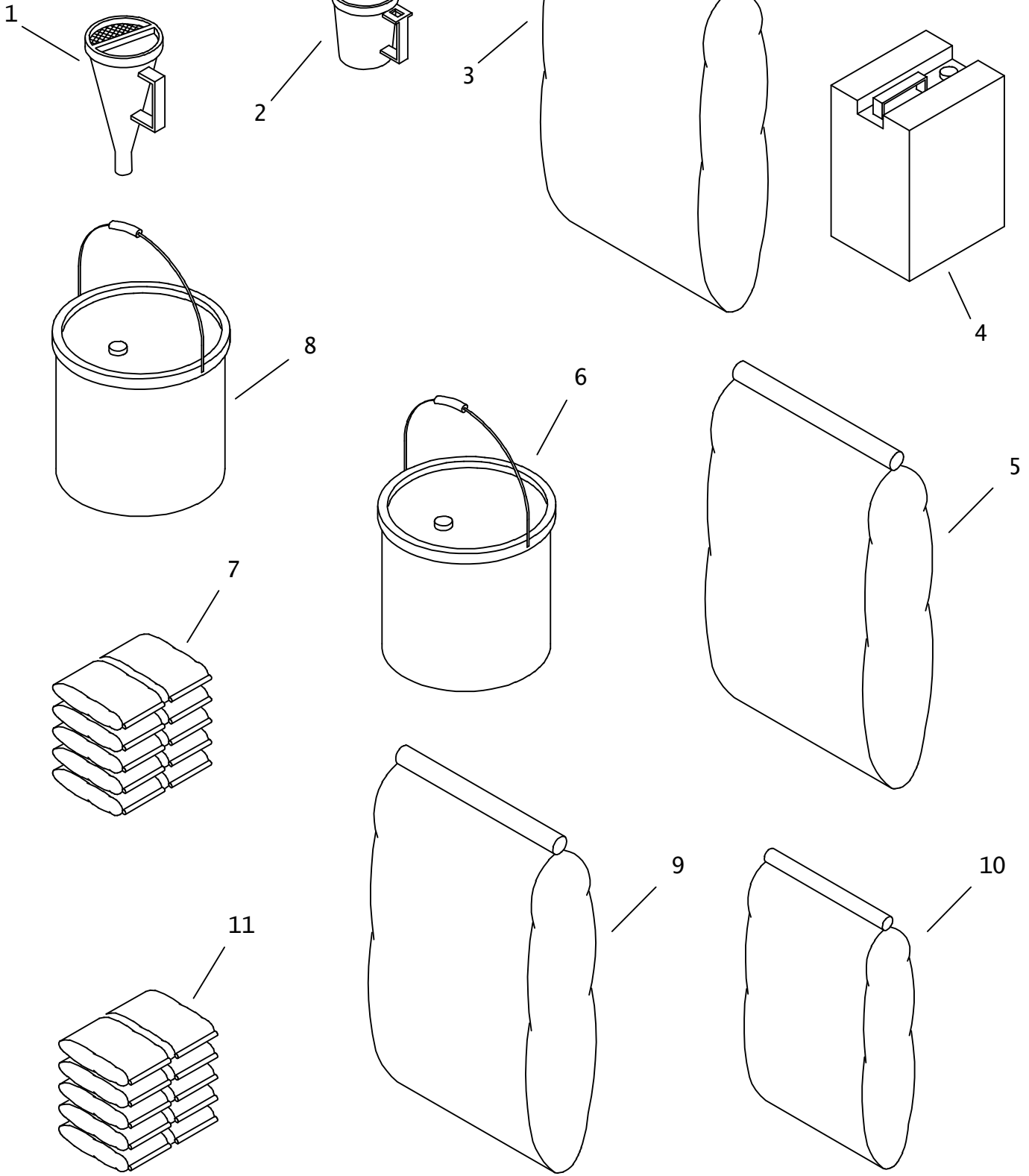
NOT SHOWN:

FOOTNOTES:

NOTE:



# FLUID MIXING ACCESSORIES



## FLUID MIXING ACCESSORIES

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	259-195	1	VISCOSITY FUNNEL	
2.	259-196	1	VISCOSITY CUP	
3.	259-804	AR	BENTONITE, QUIK-GEL (50 LB)	
4.	259-805	AR	LIQUID POLYMER, EZ-MUD (5 GAL)	
5.	259-807	AR	BENTONITE, BORE-GEL (50 LB)	
6.	259-808	AR	VISCOSIFIER, LIQUI-TROL (5 GAL)	
7.	259-809	AR	POWDER POLYMER, QUIK-TROL (20 LB)	
8.	259-810	AR	WET AGENT, CON-DET (5 GAL)	
9.	259-821	AR	'PAC-R' FILTRATION CONTROL	
10.	259-822	AR	'BARAZAN D+' VISCOSIFIER	
11.	259-832	AR	'NO SAG' (20# BOX/10-2#BAGS)	

NOT SHOWN:

191-158	1	DRILLING FLUID TEST KIT
259-487	1	SHEAROMETER

FOOTNOTES:

NOTE:



# MISCELLANEOUS

# SAE Bolt and Nut Torque Value Chart

## Grade 5: UNC or UNF Thread

Size	Hex nut, or bolt tapped into hex nut, or d&t hole		Hex top deformed locknut		Flange nut, locknut, or bolt tapped into flange nut or d&t* hole	
	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m
1/4	12	16	8	11	20	27
5/16	25	34	15	20	45	60
3/8	40	54	25	34	75	100
7/16	65	90	40	55	125	170
1/2	100	135	60	80	190	260
9/16	150	200	90	125	270	370
5/8	200	270	120	165	370	500
3/4	350	475	210	285	650	880
7/8	560	760	340	460	1250	1425
1	840	1140	500	680	1580	2145
1-1/8	1030	1400	320	840	1950	3645
1-1/4	1460	1980	880	1195	2760	3475

## Grade 8: UNC or UNF Thread

Size	Hex nut, or bolt tapped into hex nut, or d&t hole		Hex top deformed locknut		Flange nut, locknut, or bolt tapped into flange nut or d&t* hole	
	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m
1/4	14	19	10	14	24	33
5/16	30	40	18	25	50	70
3/8	55	73	35	50	90	125
7/16	85	115	50	70	140	190
1/2	130	175	80	110	220	300
9/16	190	260	110	150	310	420
5/8	260	355	160	245	430	585
3/4	450	610	270	365	750	1015
7/8	730	990	440	600	1210	1640
1	1090	1480	650	880	1320	2465
1-1/8	1550	2100	930	1260	2580	3500
1-1/4	2180	2955	1310	1780	3640	4935

\*drilled and tapped

# Metric Bolt and Cap Screw Torque Values

Size	Class 4.8				Class 8.8 and 9.8				Class 10.9				Class 12.9			
	Lubricated		Dry		Lubricated		Dry		Lubricated		Dry		Lubricated		Dry	
	N•m	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m	ft•lb	N•m	ft•lb
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1600	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

Do not use these values if a different torque value or tightening procedure is given for specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class fasteners.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to strength of original.

Make sure fastener threads are clean and that the threads are properly started. This will prevent them from cross threading or galling when tightened.

Tighten plastic insert or crimped type steel locknuts to approximately 50% of dry torque indicated on chart. Apply torque to the nut - not the bolt head. Tighten toothed or serrated type locknuts to full torque value.

LUBRICATED means coated with lubricant. DRY means plain or zinc plated without any type of lubricant.

## Hydraulic Cylinder Bolt Torque Chart

Bolt Size (inch)	Bolt Part No.	Cylinder Repair Kit Part No.	Torque (ft•lb)	Torque (N•m)
1/2	106-096	190-165	90-100	120-135
5/8	106-097	190-166 & 190-169	180-200	245-270
3/4	106-098	190-167 & 190-170	290-325	395-440
7/8	106-122	190-172 & 190-174	410-640	550-625
1	106-145	190-175 & 190-189	630-700	855-950
1-1/8	106-146	190-177	770-850	1045-1170

As a general rule:

- 1/2-inch bolts are used in cylinders with 1-inch rods
- 5/8-inch bolts are used in cylinders with 1 1/4-inch rods
- 3/4-inch bolts are used in cylinders with 1 1/2-inch rods
- 7/8-inch bolts are used in cylinders with 1 3/4-inch rods
- 1-inch bolts are used in cylinders with 2-inch rods (one with 1 3/4-inch)
- 1-1/8-inch bolts are used in cylinders with 2-1/4-inch rods

**IMPORTANT:** Do not reuse cylinder piston bolts when rebuilding a hydraulic cylinder. Each cylinder repair kit contains a new bolt. Use it. Lubricate lightly and torque to value shown on chart.

# SAE & ORS Hydraulic Fitting Replacement O-Ring Chart

Fraction Size	Dash Size	SAE (Port Seal O-Ring)		ORS (Face Seal O-Ring)	
		Thread Size	O-Ring P/N	Thread Size	O-Ring P/N
1/16	1	NA	NA	NA	NA
1/8	2	5/16 - 24	NA	NA	NA
3/16	3	3/8 - 24	NA	NA	NA
1/4	4	7/16 - 20	155-760	9/16 - 18	157-037
5/16	5	1/2 - 20	NA	NA	NA
3/8	6	9/16 - 18	155-705	11/16 - 16	157-038
1/2	8	3/4 - 16	155-706	13/16 - 16	157-039
5/8	10	7/8 - 14	155-707	1 - 14	157-040
3/4	12	1-1/16 - 12	155-709	1-3/16 - 12	157-017
7/8	14	1-3/16 - 12	155-747	NA	NA
1	16	1-5/16 - 12	155-748	1-7/16 - 12	155-714
1-1/4	20	1-5/8 - 12	155-702	1-11/16 - 12	NA
1-1/2	24	1-7/8 - 12	157-001	2 - 12	NA
2	32	2-1/2 - 12	NA	NA	NA
2-1/2	40	3 - 12	NA	NA	NA
3	48	3-1/2 - 12	NA	NA	NA

Thread size indicates the diameter of the threaded area in fractions of an inch and number of threads per inch.

NA = not a current CMW part numbered o-ring, or dash size does not occur in current CMW applications

SAE = straight thread fitting that seals by sandwiching a hard o-ring between a shoulder on the male part and an angular surface at the mouth of the female port.

ORS = o-ring face seal; a type of fitting that seals by compressing a hard, captive o-ring between two flat parallel faces, one grooved for the o-ring and the other plain to act as the sealing surface



# FM25

## Related Publications

	<b>Component</b>	<b>Ass'y</b>	<b>P/N</b>
<b>Model:</b>			
FM25	Parts Manual		053-1153
FM25	Operators Manual		053-1187
FM25	Repair Guide (Service Manual)		N/A
FM25	Supplementary Maint Guide - Trailer		055-484
FM25	Supplementary Maint Guide - Trenchless		055-485
FM25	Special Tools Guide		052-901
 <b>Engine:</b>			
Kubota	Parts Manual	194-541 / 195-1188	053-082 / 053-1338
Kubota	Operators Manual	194-541 / 195-1188	054-051 / 053-1337
Kubota	Service (Shop) Manual	195-1188	055-051

## Filters

<b>Engine:</b>			
	Air Filter Parts Ass'y		194-035
	Element (primary)		194-038
	Element (secondary)		194-039
	Oil Filter Element		194-041
	Fuel Filter		194-386

## Optional Kits

	O-ring Repair Kit - FLG, ORS & SAE (15 different O-rings)		190-051
	O-ring Repair Kit - Field Service (46 different O-rings)		190-052



# Ditch Witch®

## Parts Manual Change Request

(Please print clearly)

Date: \_\_\_\_\_ Dealer No. (required): \_\_\_\_\_

Your Name: \_\_\_\_\_ Position: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

### Publication Information:

Parts Manual No.: \_\_\_\_\_ - \_\_\_\_\_ Model: \_\_\_\_\_

Illustration Part No.:	Manual Page No.:
1. _____ - _____ .....	1. _____
2. _____ - _____ .....	2. _____
3. _____ - _____ .....	3. _____

### Nature of Change Request:

- Text
- Graphics
- Missing Information

Describe change requested (if possible, include copy of publication page with changes marked.):

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**Please fax completed form to  
Parts Manual Department (580) 572-3525**

*Thank you for taking the time to submit this request. We will contact you if further information is needed to process your request.*



**A Note To  
Ditch Witch  
Equipment Owners:**

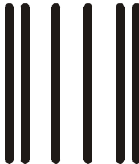
If your equipment was purchased through a Ditch Witch dealer, there is no need to read further.

However, if you purchased from any other source, please fill out the form on the reverse side and return it to us.

This will enable you to receive updates on this equipment as well as information on new products of interest.

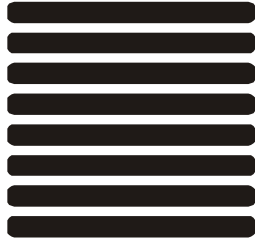
Thanks for using Ditch Witch equipment.

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Model

Serial Number

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Attachments/Accessories

Serial Numbers

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Serial Numbers

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Attachments/Accessories

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