

I

# **OPERATION, SAFETY & MAINTENANCE GUIDE**

# Section 1 OPERATION & MAINTENANCE Section 2 INSTALLATION



# IOWA MOLD TOOLING CO., INC.

BOX 189, GARNER, IA 50438-0189 TEL: 641-923-3711

MANUAL PART NUMBER: 99903447

Iowa Mold Tooling Co., Inc. is an Oshkosh Truck Corporation company.

# **REVISIONS LIST**

DATE	LOCATION	DESCRIPTION OF CHANGE
20020801 20021110	ALL OPERATION & INSTALLATION	NEW RELEASE - VERSION 1 RELEASED INFORMATION ON DSS BODIES
20020801 20021110 20030130 20030423 20030715 20030807 20030814 20030825 20040402 20050131 20050523 20050921 20060313 20070329 20070510	ALL OPERATION & INSTALLATION 2-5,23,24 2-5 2-4,26 2-3,5,23 1-4,5 2-26 1-2,6-8, 10 2-3 2-4 2-25 2-23,24 COVER 2-24 2-24	NEW RELEASE - VERSION 1 RELEASED INFORMATION ON DSS BODIES ECN 9125 - WIRING & ELECTRIC CRANE INSTALLATION INFORMATION ECN 9125 - CHANGE TO WIRING ECN 9125 - ADDED WIRING, COMP. INSTALLATION DWG. ECN 9224 , 9227 - CHANGES TO WIRING, RIVET LENGTHS EDITS TO REDUCED CAPACITY WORDING, LOAD CHART ECN 9231 - DISTANCE CHANGE ON 99903524 REPLACED ORIGINAL PHOTOS WITH CURRENTLATCHES ADDED 77441093 HARNESS MARKER EXT 11' RSD TO 99903481 INSTL. KIT CORRECTED MISPRINT ON ITEM#17 - SCREW ECN 9952 - ADDED 741158 TO 9901295 DRAWING ECN 9982 - ADDED 741158 TO 9901295 DRAWING ECN 9982 - ADDED 74141158 TO 9901295 DRAWING ECN 9900 - REVERSED PIN 30 AND 87

# INTRODUCTION

This manual is intended as a basic source of information on safely operating and maintaining your IMT Diamond Series body. Although safety issues regarding your product are addressed in this manual, it is not intended as an all encompassing "rule book" on safety. It is **YOUR RESPONSIBILITY** as the product owner/operator to identify specific safety hazards and determine proper procedures to prevent hose hazards from infilcting injury.

This manual is divided into sections which nclude an operation guide, a maintenance checklist and guide, safety information, and general reference information pertinent to your IMT Diamond Series product.

Familiarity with this manual, government regulations, hazards and the specific operations of your equipment is a necessity. You must use caution and follow all safety procedures and applicable regulations while operating and maintaining your equipment.

Equipment modifications must be performed with IMT approved accessories, parts and optional equipment. DO NOT alter or modify any safety device, whether electrical, hydraulic, or mechanical in nature.

To highlight safety issues, NOTE's, CAUTION's and WARNING's are included throughout the manual. They are defined as:

NOTE

A NOTE IS USED TO EITHER CONVEY ADDITIONAL INFORMATION OR TO PROVIDE FURTHER EMPHASIS FOR A PREVIOUS POINT.

#### CAUTION

A CAUTION IS USED WHEN THERE IS A STRONG POSSIBILITY OF DAMAGE TO THE EQUIPMENT OR PREMATURE EQUIPMENT FAILURE.

WARNING

A WARNING IS USED WHEN THERE IS THE POTENTIAL FOR PERSONAL INJURY OR DEATH.

It is the responsibility of the owner and/or designated employee to inform all operators, maintenance personnel and others involved in the equipment operation about safe operation, maintenance, and repair procedures. If any questions arise, contact IMT or your IMT distributor for clarification. Please furnish a copy of this manual to all persons involved in operation or maintenance of your equipment. IMT grants you, the purchaser, the right to reproduce this document for that purpose and to further the education in safe operation and maintenance.

# **NOTICE TO THE OWNER / USER**

If your equipment is involved in a property damage accident, contact your IMT distributor immediately and provide them with the details of the accident and the serial number of the equipment. If an accident involves personal injury, immediately notify your distributor and IMT's Safety Director at:

IOWA MOLD TOOLING CO., INC. 500 HWY 18 WEST, GARNER, IA 50438 641 - 923 - 3711




# **SECTION 1. OPERATION & MAINTENANCE**

1.0 FEATURES	2
1.1 BODY CONFIGURATION	2
2.0 MINIMUM CHASSIS REQUIREMENTS	2
3.0 VEHICLE POSITION	2
3.1 BODY SET-UP	3
4.0 UNIT CAPACITY	4
5.0 BODY FEATURES	6
5.1 COMPARTMENT DOORS & LATCHES	6
5.2 MASTER LOCK SYSTEM	6
5.3 COMPARTMENT OPTIONS	7
5.3.1 ADJUSTABLE SHELF	7
5.3.2 BOOKSHELF	7
5.3.3 TANK BRACKET	7
5.3.4 ROLL-OUT DRAWER	7
5.4 TIE-DOWNS	7
5.5 TRAILER HITCH ON BUMPER	7
5.6 TAILGATE	7
6.0 LIGHTING	8
6.1 COMPARTMENT LIGHT OR FLOODLIGHT OPTIONS	8
7.0 PTO OPTION	8
7.1 ENGAGING THE PTO	8
7.2 DISENGAGING THE PTO	8
8.0 COMPRESSOR	9
9.0 SAFETY EQUIPMENT	9
10.0 GUIDE TO MAINTENANCE	9
11.0 GREASE REQUIREMENTS	9
12.0 TROUBLESHOOTING 1	10

## **1.0 FEATURES**

Your IMT Diamond Series body offers numerous features to improve your mobile worksite conditions. Whether you will be using the IMT Diamond Series vehicle for utility work, construction, municipal applications, or more, your IMT Diamond Series vehicle will improve your ability to work on the road. Features of the IMT Diamond Series body include:

- Flush mounted doors with hidden hinges and durable, tee-style leak-proof plastic latches
- DOT lights and reflectors
- Master lock systems
- 42" high compartments
- Recessed cargo tie-downs
- Outriggers
- Optional adjustable shelves
- Optional compartment lights
- Optional hydraulic systems
- Optional compressor

#### **1.1 BODY CONFIGURATION**

Know the components of your unit. Doing so will aid in the communication of problems to maintenance personnel as well as provide immediate reference during an emergency situation. Use Figures 1A and 1B for component identification for your IMT Diamond Series body.

#### 2.0 MINIMUM CHASSIS REQUIRE-MENTS

The minimum chassis requirements for an IMT Diamond Series body are:

- 10,500 lb gross vehicle weight
- Dual rear wheels
- 6,000 lb rear axle
- 4,500 lb front axle
- 9' body 60" cab to axle distance (CA)

#### **3.0 VEHICLE POSITION**

Before beginning work with your unit, park the carrier vehicle over a firm and level surface for adequate outrigger support. If outriggers appear to bury themselves in a less than firm surface, then DO NOT perform a lift until a suitable location is found. DO NOT position the outriggers near sharp drop-offs or areas of uncertain firmness.



Body Compartments

Outrigger



Master Lock Handle

Master Lock Handle

Figure 1B: Component Identification from Rear of Body

Figure 1A: Component Identification from Side of Body

Rear outriggers are included on all IMT Diamond Series crane bodies to stabilize the unit when using the crane. The Diamond Series crane units include a manual out/manual down outrigger on the crane mount side of the body, and a manual down outrigger on the other side of the body.

#### WARNING

OUTRIGGERS CAN PINCH, STRIKE, OR CRUSH PEOPLE OR OBJECTS! MAKE SURE THERE ARE NO OB-STRUCTIONS BEFORE OPERATING OUTRIGGERS.

Although the outriggers are critical to safe and stable operation, they can be hazardous due to their close proximity to the operator and other personnel. They are the only component of the body which normally contact the ground.

To set up the outriggers:

1) Release the pin which locks the manual out/manual down outrigger in the retracted, locked position.

2) Extend the outrigger. Be careful not to overextend - there is no positive stop on this outrigger and it could fall and hurt you or damage equipment. Once extended, replace



Outrigger in Retracted Position

the pin to lock the outrigger.

3) Remove the outrigger leg pin, and lower the outrigger leg until full ground contact and solid stability is achieved. Replace the pin.

4) Repeat step three for the manual down outrigger.



Outrigger Extended



Outrigger extended with Leg Lowered

Figure 2: Outrigger Set-Up

# 4.0 UNIT CAPACITY

The capacity of the crane on your Diamond Series body is dependent upon the crane rating and the chassis upon which the body is installed.

Your IMT DSC crane body is rated for an IMT 20,000 ft-lb crane (IMT Model 2020), and your IMT DSS body is rated for up to a 1/2-ton crane. However, to determine the crane capacity for a particular lifting situation, you must know both your load and the direction of your lift to determine the capacity for your particular situation.

On a DSC body, you should find a capacity placard, similar to the sample in Figure 3, mounted on your crane or body. Exceeding the limits presented on the capacity placard will create severe safety hazards and will shorten the life of the crane. You and other concerned personnel must know the load capacity of the crane and the weight of the load being lifted!

In some cases, due to chassis front axle limitations, the capacity of your unit may be reduced when lifting beyond 90° from the back of the truck using a 9-foot body. Figure 4 illustrates a sample capacity placard for the reduced lifting capacity of the IMT Diamond Series body using an IMT 2020 crane. The crane capacity may be reduced up to 66% for lifts made further than 90° behind the back of the truck.

# WARNING

NEVER EXCEED THE RATED LOAD CAPACITIES. OF THE UNIT. DOING SO WILL CAUSE STRUCTURAL DAMAGE AND DAMAGE TO CRANE WINCHES AND CABLES AND TO THE BODY, WHICH CAN LEAD TO SERIOUS INJURIES OR DEATH.

Prior to lifting a load:

1. Determine the weight of the load.

2. Determine the weight of any load handling devices.

3. Add the weight of the load and the weight of the load handling devices. The sum will be the total weight of the load being lifted.

1 - 4

4. Determine the distance from the centerline of crane rotation to the centerline of the load being lifted.

5. Determine the distance from the centerline of crane rotation to the centerline of where the load is to be moved to.

6. The actual distance used should be figured as the larger of items 4 and 5 above.

7. Determine at what angle the crane will be operated (for example 30°, 45°, etc.) by referencing the angle indicator on the lower boom.

8. Make certain that 2-part line is used for any lift which requires 2-part line. (Note: The two-part line weight is noted in a box on the capacity chart.)



Figure 3: Sample Capacity Placard

# **DSC20 REDUCED CAPACITY LOAD CHART**

1-5



Figure 4: Sample Reduced Capacity Chart

# **5.0 BODY FEATURES 5.1 COMPARTMENT DOORS &** LATCHES

Your IMT Diamond Series body features 42" high compartments on each side of the body. The vertical compartments have springs on the doors. To close these compartments, push gently on the spring to release it prior to closure.

Compartments which open horizontally do not have springs, and the doors use gravity to open fully.

All compartment doors have a leak-proof "T" style latching system. After compartment doors are closed, the latch turns to lock into place. After the latch is rotated into latching position, the striker draws the door into the weather-strip when the "T" is pushed into the locking position.



Latches on the IMT Diamond Series body have a two-step closure feature. They must be turned to completely lock the door. See Figure 6 for latch in open position.

# Figure 5: Door Latches



Figure 6: Latch in Open Position

#### 5.2 MASTER LOCK SYSTEM

Compartments on both sides of the body can be locked using the "Master Lock" system. See Figure 6 for the Master Lock handle.

To operate the Master Lock system,

1) Close all cabinet doors on the side you wish to lock.

2) Push the Master Lock handle completely in, and secure the locking system with a padlock. The hole in the system is large enough for a 1/4" padlock.

3) Repeat for the other side of the body, if desired.

To release the Master Lock system,

1) Remove the padlock from the Master Lock handle.

2) Pull the handle open.



Master Lock Handle

Figure 7: Master Lock Handle

# 5.3 COMPARTMENT OPTIONS 5.3.1 ADJUSTABLE SHELF

Adjustable shelves are an option for both the horizontal and vertical compartments on the sides of your IMT Diamond Series body. These shelves can be raised and lowered to the position you require using the brackets on the cabinet interior.

#### 5.3.2 BOOKSHELF

A bookshelf is available for the horizontal compartment on the left side of your body. This shelf can be used to hold parts manuals or other technical books required in your work.

#### **5.3.3 TANK BRACKET**

The right front compartment on your body is vented for oxygen or acetylene. You can purchase a tank bracket to support two tanks of oxygen or acetylene for this cabinet only.

#### WARNING

ONLY THE RIGHT FRONT COMPART-MENT IS VENTED ON THE IMT DIA-MOND SERES BODY. DO NOT USE OTHER COMPARTMENTS FOR OXY-GEN, ACETYLENE, OR OTHER GASES.



Horizontal compartment with shelf

Right front compartment with tank bracket assembly

Figure 8: Compartment Options

A roll-out drawer option is also available for the front right and front left compartments. These drawers can be accessed by pulling on them.

The drawers roll out from the body on steel tracks.

#### CAUTION

BE SURE TO ROLL THE DRAWER IN COMPLETELY PRIOR TO SHUTTING THE COMPARTMENT DOOR.

#### **5.4 TIE-DOWNS**

The bed of the IMT Diamond Series body features four tie-downs which can be used to secure items to the body or to remove the body from the chassis. These tie-downs lie flush in the bed when not in use.

#### **5.5 TRAILER HITCH ON BUMPER**

The rear bumper of the body has a mounting plate which can be used for a trailer hitch. Figure 8 shows the decal located on the bumper.

# CAUTION

Maximum Towable Load: 16,000 lb Maximum Tongue Weight: 2,000 lb

Tow vehicle trailer rating may be less. DO NOT exceed the chassis manufacturer's trailer towing ratings.

70396266

# Figure 9: Maximum Bumper Load Decal

Note that the chassis trailer rating may be lower than the figures indicated. Be sure not to exceed the maximum rated load for the rear bumper or chassis.

# **5.6 TAILGATE**

Your IMT Diamond Series body has a standard poly tailgate which drops in and out of the rear of the bed.

A hinged tailgate is available for your body, and the 8" high tailgate attaches to the sides of the bed. This tailgate gives you slightly more room at the rear of the bed because brackets to support the poly tailgate are not required.

# 6.0 LIGHTING

Standard IMT Diamond Series bodies are equipped with DOT lights and reflectors. Lighting options include a compartment light kit and a flood light kit with two flood lights for the rear of the body.

# 6.1 COMPARTMENT LIGHT OR FLOOD-LIGHT OPTIONS

If your body has a compartment light or floodlight kit, these lights are operated using a control panel inside the compartment. See Figure 9. Using the control panel, you can operate the air compressor, the right and left compartment lights, and the flood lights.



# Figure 10: Compartment Light Control Panel

# 7.0 PTO OPTION

If you have a crane mounted on your IMT Diamond Series body, this crane may be electric, or may be powered by a pump and power take-off (PTO).

# NOTE:

FOLLOW MANUFACTURER INSTRUC-TIONS TO ENGAGE THE PTO IN YOUR VEHICLE. THE INSTRUCTIONS IN THIS MANUAL MAY NOT BE ACCURATE FOR ALL PTO'S.

# 7.1 ENGAGING THE PTO

1-8

- A. Automatic Transmission
- 1) Set the vehicle parking brake.
- 2) Turn on the vehicle engine.
- 3) Put the vehicle in "Park" or "Neutral".
- 4) Engage the PTO according to the

manufacturer's instructions. With an electrical "Hot Shift" PTO, press the switch to the "ON" position. NOTE: A light will come on to show the PTO is engaged.

5) Warm the engine to operating temperature.

- 6) Begin crane operation.
- B. Manual Transmission
- 1) Set the vehicle parking brake.
- 2) Place the transmission in "Neutral".
- 3) Make certain the PTO lever is in the "OFF" position.
- 4) Start the vehicle engine.
- 5) Fully depress the clutch.

6) Engage the PTO. With a cable-shift PTO, move the lever to the "ON" position. With an air shift PTO, move the valve to the "ON" position.

7) Release the clutch gradually.

8) Warm the engine to operating temperature.

9) Begin crane operation.

# 7.2 DISENGAGING THE PTO

1) Fully depress the vehicle's clutch pedal (if manual).

2) Disengage the PTO (OFF).

3) Release the clutch pedal gradually.

# DANGER:

DO NOT COME IN CONTACT WITH THE PTO. DEATH OR SERIOUS INJURY MAY OCCUR.

# WARNING:

DISENGAGE THE PTO PRIOR TO MOVING THE VEHICLE. FAILURE TO DO SO MAY CAUSE PUMP AND PTO DAMAGE, AND INADVERTENT OPERA-TION OF THE CRANE DRIVE TRAIN, WHICH COULD CAUSE AN ACCIDENT.

#### 8.0 COMPRESSOR

Your IMT Diamond Series body may have an air compressor. See the compressor manual for complete details on operating the compressor.

#### 9.0 SAFETY EQUIPMENT

Safety equipment options that may be purchased with the IMT Diamond Series body include a fire extinguisher or complete safety kit which includes a mounted fire extinguisher and a triangular traffic warning bracket.

# **10.0 GUIDE TO MAINTENANCE**

To obtain reliable and satisfactory service, the IMT Diamond Series body requires a consistent preventive maintenance schedule. Take necessary and reasonable precautions during Diamond Series maintenance to avoid equipment and personal injury.

#### WARNING

BEFORE PERFORMING ANY MAINTE-NANCE FUNCTION, BE SURE ALL SYSTEMS ARE "OFF". TURN OFF ALL SYSTEMS USING THE ELECTRICAL PANEL IN THE REAR OF THE VEHICLE.

Prior to beginning vehicle maintenance, 1. Park the vehicle is an area where other equipment is not operating and where there is no through traffic.

2. Set the vehicle parking brake.

3. Place all controls in the "OFF" position and disable all systems.

4. Disconnect the PTO, if applicable.

5. Relieve the hydraulic pressure from all circuits before disconnecting any hydraulic fittings or components.

6. Replace parts with only factory-approved replacements.

After maintenance, before putting the truck back into service,

1. Replace all shrouds, guards, and safety devices which were removed.

2. If applicable, purge all trapped air in the hydraulic system to prevent erratic operation.

3. Remove grease and oil from all controls.

## **11.0 GREASE REQUIREMENTS**

1-9

Hinges and latches on the compartment doors of the Diamond Series body should be greased once or twice per year. Grease using a multi-purpose spray grease. (IMT uses Mystic JT-6 grease but an equivalent grease is acceptable.)

#### **12.0 TROUBLESHOOTING**

Use the following table to help you diagnose and resolve problems with your IMT Diamond Series vehicle. For issues not listed on this chart, contact IMT Technical Support at 641-923-3711.

PROBLEM	CAUSE	SOLUTION
Lights do not operate.	Faulty wiring.	Check fuses in wiring. Replace if needed
Doors do not latch.	Latch is not completely turned in closed position.	Make sure latch is turned so door is sealed.
Master lock system does not work.	Doors aren't completely closed.	Fully latch all doors.
	Misalignment of components.	Adjust finger positioning on master lock. rod.

# **SECTION 2. INSTALLATION**

1.0 INSTALLATION INTRODUCTION	2
2.0 CHASSIS SPECIFICATIONS	2
3.0 COMPONENT INSTALLATION	3
ELECTRICAL INSTALLATION (99903481)	3
DOOR ASSEMBLY (99903548)	4
FRONT END WIRING (99903444)	5
4.0 CHASSIS INSTALLATION	3
INSTALLATION FOR FORD GVW UP TO 17,500 LBS	3
5.0 OPTIONS INSTALLATION	7
PTO & PUMP	7
DRIVELINE & PUMP INSTALLATION 8	3
COMPRESSOR INSTALLATION 8	3
DRIVELINE INSTALLATION TECHNIQUES 8	3
INSTALLATION - HYDRAULIC CRANE KIT (1) 12	2
INSTALLATION - HYDRAULIC CRANE KIT (2)13	3
INSTALLATION - HYDRAULIC CRANE KIT (3) 14	1
HYDRAULIC SCHEMATIC (4) 15	5
INSTALLATION - COMPRESSOR HYD KIT (1)16	3
INSTALLATION - COMPRESSOR HYDRAULIC KIT (2) 17	7
COMPRESSOR HYD KIT (3) 18	3
INSTALLATION - CRANE & COMPRESSOR HYD KIT (1) 19	)
INSTALLATION - CRANE & COMPRESSOR HYD KIT (2)	)
INSTALLATION - CRANE & COMPRESSOR HYD KIT (3)	I
INSTALLATION - CRANE & COMPRESSOR HYD KIT (4)	2
HYDRAULIC TELESCOPING CRANE-ELECTRICAL INSTALLATION (99901294) 23	3
ELECTRIC TELESCOPING CRANE-ELECTRICAL INSTALLATION (99903519) 24	1
DA435HA COMPRESSOR-ELECTRICAL (99901295)25	5
20013 COMPRESSOR - INSTALLATION DRAWING (99903524)	3

# **1.0 INSTALLATION INTRODUCTION**

You may have purchased your IMT Diamond Series body as a ship-out unit or as an installed unit on a chassis. If you purchased a ship-out unit, you received a primed body and uninstalled components including the master lock system, lights, wiring, weatherstripping and any options you may have ordered.

IMT recommends that you finish the body, including painting, wiring, and weatherstripping, prior to installing it on a chassis.

The installation instructions in this manual are arranged in the appropriate order:

• Component installation including doors and lights

• Chassis installation on specific chassis sizes

Options installation

# 2.0 CHASSIS SPECIFICATIONS

Your IMT Diamond Series body is designed for installation on a **dual rear wheel chassis only.** Installations differ based on the gross vehicle weight (GVW).

# **3.0 COMPONENT INSTALLATION**

## **ELECTRICAL INSTALLATION (99903481)**

1.	70145799	RETAINER-ELEC HARNESS	34
		(NOT SHOWN)	
2.	77044237	TERMINAL-BULLET PLUG	1
3.	70034366	PLUG-PLASTIC BUTTON 1-1/8"	8
4.	76393636	GROMMET - RUBBE R2.00	4
5.	77040358	LIGHT-CLEAR AMBER	2
6.	77040357	LIGHT-CLEAR RED	2

77040357 LIGHT-CLEAR RED 6.

7.	72062106	NUT #10-24 HEX NYLOC ZINC	3
8.	72060636	SCREW-MACH #10-24 X 3/4 RDH	12
9.	77441004	LIGHT-LICENSE PLATE PLASTIC	1
10.	51715985	<b>KIT-LICENSE PLATE HARDWARE</b>	1
11.	77040419	LIGHT-MODULE TRUCKLIGHT R	H 1
12.	77040418	LIGHT-MODULE TRUCKLIGHT LI	H 1
13.	77441022	HARNESS-TRUCK TAIL LIGHT	2
14.	77441021	HARNESS-FRONT MARK LIGHTS	3 2
15.	77441020	HARNESS-REAR DOT LIGHTS	1
16.	77441090	HARNESS, EXT COMPT RR	A/R
	77441091	HARNESS MARKER EXT 9'	A/R
	77441092	HARNESS MARKER EXT 11'	A/R
	77441093	HARNESS, MARKER EXT 11' RSI	A/R



#### ASSEMBLY NOTES

1. The electrical harness fits through a channel above the doors. This keeps it from being able to move around, fall into the door openings, or get tangled with other equipment.

2. The connectors on the electrical harnesses can only be plugged into the correct connectors at the other end. They cannot be connected incorrectly as they will only fit into one connector.

#### DOOR ASSEMBLY (99903548) (EFFECTIVE 5-15-03. REPL. 99903480)

			9'	11'
1.	52718140	DOOR WELDMENT-FRONT	2	2
2.	52718139	DOOR WELDMENT-REAR	2	4
3.	52718141	DOOR WELDMENT-HORIZ	2	2
4.	70393719	RUBBER PLUG	8	12
5.	72060636	SCR-MACH #10-24 X 3/4 RDH PH	8	12
7.	72062104	NUT 1/4-20 HEX NYLOC ZINC	8	12
8.	60123528	MANUAL BOX	1	1
9.	72061004	SCR-SHT MET 14X3/4 SLT HEX	6	6
10.	72661575	LATCH-3-PT T-STYLE W/STRIKE	6	8
11.	72661550	CABLE-PLASTIC COATED	2	2
12.	70396116	DOOR HOLDER-SPRING	4	6
13.	89396430	WEATHERSTRIPPING	60'	80'
14.	76396419	GASKET-LATCH	6	8
15.	60123799	SPACER-SPRING DOOR STOP	4	6
16.	60123800	BRACKET-SPRING DOOR STOP	4	6
17.	72601652	SCR-MACH 1/4-20 X 3/4 RH	20	28
18.	72062106	NUT 10-24 HEX NYLOC ZINC	8	12
19.	72601590	CAP SCR SS 5/16-18 X 1.00 TRH	8	8
20.	72063002	WASHER 5/16 FLAT	8	8
21.	72062109	NUT 5/16-18 HEX NYLOC ZINC	4	4
22.	72062001	NUT 5/16-18 HEX ZINC	4	4
23.	72061100	SCR-SELF TAP 10 X 1/2 HH SLOT	8	8
24.	72661349	POP RIVET .19 X .25 GRIP	24	32

#### ASSEMBLY NOTES 1. Center doors in door jams prior to the final screw tightening.

2. Install weatherstripping with the "bulb side" facing the door, for proper seal when the door is closed.

3. The door spring is constructed with a cable inside the spring so the door cannot be opened too far.

4. Bolt item #11, cable, to the door and upper door jam on horizontal doors. This prevents the door from opening too far and damaging itself or the body.



9' LH SIDEPACK SHOWN. RH IS MIRROR IMAGE. QTY LISTED IS FOR BOTH SIDES.

11' BODY IS IDENTICAL, EXCEPT 2ND VERTICAL COMPARTMENT COMPONENTS ARE SAME AS REAR COMPARTMENT.





72060118 (CAP SCREW 1/2-13 X 2.00 HH GR8) - 10 72062080 (NUT 1/2-13 HEX NYLOC ZINC) - 10 72063005 (WASHER 1/2 FLAT) - 20 INSTALLATION KIT:

ASSEMBLE THE DIAMOND SERIES BODY TO THE USE THE CAP SCREWS, NUTS, & WASHERS TO EXISTING HOLES IN THE CHASSIS FRAME.

UNDERSIZED - YOU MAY NEED TO REAM THEM OUT NOTE: THE PRE-DRILLED HOLES ARE PURPOSELY FOR THE CAP SCREWS TO FIT.

**INSTALLATION FOR FORD GVW UP TO** 

# **PTO & PUMP**

#### GENERAL

This section pertains to the installation of the IMT compressor, PTO and pump. The instructions are intended as a guide to assist you with your particular installation. These instructions will provide only general information.

#### PTO AND PUMP INSTALLATION

The pump may either be installed directly on the PTO (see below) or, as an optional method, it may be driven by a driveline (see following page).

#### **PTO INSTALLATION**

Power take-off manufacturers provide specific installation instructions for their products. Those instructions should be followed when installing a PTO. Check with the PTO manufacturer's representative for specific instructions regarding your particular make, model and year of vehicle. The following instructions are a guide in this application.



PTO INSTALLATION

1. If the vehicle is new, drain the transmission oil into a clean container for reuse. If the vehicle is used, drain and dispose of the transmission oil properly.

2. Temporarily install the PTO with the proper gaskets and only two studs. Snug the PTO down and check the backlash for maximum

allowance of .006" to .012". If the backlash is excessive, remove gaskets and check backlash again until it is corrected.

3. Remove the PTO and apply Permatex® to the gaskets. If the holes for the studs are tapped through the transmission housing, apply Permatex to the studs and tighten them down. Make certain that the studs do not interfere with the transmission gears.

Registered Trademark of Permatex Co., Inc., Kansas City, Kansas

# CAUTION

AVOID CONTACT OF PERMATEX WITH TRANSMISSION FLUID.

4. Install the PTO and gaskets. Torque the nuts to 30 - 35 ft-lbs (4.14 - 4.84 kg-m) for a 6-bolt PTO and 45 - 50 ft-lbs (6.22 - 6.91 kg-m) for 8-bolt PTO's. Recheck the backlash.

5. Install the shifter cable to suit conditions. Always allow for a slight overshift on lever or knob to ensure the PTO is fully disengaged.

#### CAUTION

IT IS IMPORTANT THAT ADEQUATE SPACE BE ALLOWED FOR FULL EN-GAGEMENT OF THE PTO. MODIFY THE EXHAUST OR OTHER OBSTRUCTIONS AS NEEDED.

#### CAUTION

AVOID SHARP BENDS IN THE SHIFTER CABLE. ALL BENDS SHOULD HAVE AT LEAST A 6" RADIUS. TIGHTER BENDS WILL CAUSE DIFFICULT OPERATION OF THE SHIFTER KNOB.

6. Replace the transmission oil. If the PTO is located below the transmission oil level, an additional quantity of oil will be required.

7. Start the engine, engage the PTO and check for proper PTO rotation. Allow it to run for 5 - 10 minutes. Check for leaks, unusual noise and proper operation.

8. Retorque the mounting bolts.

**5.0 OPTIONS INSTALLATION** 

**DRIVELINE & PUMP INSTALLATION** 

The pump may be driven as shown in figure "Driveline & Pump Installation" as an optional method to the one shown in "PTO Installation". The following steps are a guide in this application.

1. Install the PTO (refer to "PTO Installation").

2. Loosely bolt the pump mounting bracket to the adjustable bracket in figure below.

3. Bolt the adjustable bracket to the frame at a point that will not exceed 48" (122cm) from the PTO and will not cause a joint angle greater than 3°.

4. Check the pump rotation and install pump, pump end yoke and PTO end yoke.

5. Size, cut and weld the driveline to the necessary length. Ensure driveline balance and run out meet specification. Allow 1" (2.54cm) extra for PTO end yoke.

6. Install driveline in phase with proper operating angle calculations, lock set screws and grease U-joints and mating spline.

7. Ensure all mounting bolts are tight.

#### **COMPRESSOR INSTALLATION**

See Installation Kit Drawing in the Parts Section of your compressor manual for specific installation and parts information.

# DRIVELINE INSTALLATION TECH-NIQUES

#### **U-JOINT OPERATING ANGLES**

Every U-joint that operates at an angle creates vibration.

U-joint operating angles are probably the most common cause for driveline vibration in vehicles that have been reworked or that have had auxiliary equipment installed.



#### WARNING

• Inspect the final position of the driveline to see if operators or other personnel are protected from rotating driveline hazards.

• If the protection is insufficient, install a guard. Contact IMT for instructions on guarding a rotating driveline.

FAILURE TO HEED THIS WARNING MAY RESULT IN SERIOUS INJURY OR DEATH.



DRIVELINE & PUMP INSTALLATION

When reworking a chassis or installing a new driveshaft in a vehicle, make sure that you follow the basic rules that apply to u-joint operating angles, as follows:

1. U-joint operating angles at each end of a shaft should always be at least 1°.

2. U-joint operating angles on each end of a driveshaft should always be equal within 1° of each other.

3. U-joint operating angles should not be larger than 3°. If more than 3°, make sure they do not exceed the maximum recommended angles for the RPM at which they will be operating.

A u-joint operating angle is the angle that occurs at each end of a driveshaft when the output shaft of the transmission and the input shaft of the pump are not in line. See figure.



The connecting driveshaft operates with an angle at each u-joint. It is that angle that creates a vibration.

#### **REDUCING AND CANCELING VIBRATION**

A key point to remember about u-joint operating angles: To reduce the amount of vibration, the angles on each end of a driveshaft should always be SMALL.

To cancel an angle vibration, the u-joint operating angles need to be EQUAL within 1° at each end of a shaft. See figure.



Make angles equal

# SGL PLANE & COMPOUND U-JOINT OPERATING ANGLES

There are two types of u-joint operating angles, single plane and compound.

#### SINGLE PLANE

Single plane angles occur when the transmission and pump components are in line when viewed from either the top or side, but not both.

Determine the u-joint operating angle in an application where the components are in line when viewed from the top, but not in line when viewed from the side, is as simple as measuring the slope of the components in the side view, and adding or subtracting those slopes to determine the angle. See figure.



These angles should be SMALL and equal within 1°.

Determine the u-joint operating angles on a shaft that is straight when viewed from the side and offset when viewed from the top requires the use of a special chart (See accompanying chart). In this type of application, the centerlines of the connected components must be parallel when viewed from the top, as shown. These angles should also be SMALL and equal within 1°. See figure.



Look at the angle chart and note that the smaller the offset, the smaller the resultant angle.

To reduce the possibility of vibration, keep any offset between connected points to a minimum.

There are two things which can be done to make certain single plane angles are SMALL and EQUAL:

• Make sure that the transmission and pump are mounted so that their centerlines are parallel when viewed from both the side and the top.

• Make sure the offset between them is mall in both views.

#### **COMPOUND ANGLES**

Compound u-joint operating angles occur when the transmission and pump are not in line when viewed from both, the top and side. Their centerlines, however, are parallel in both views. See figure.



#### **TRUE U-JOINT OPERATING ANGLE**

The true u-joint operating angle, which must be calculated for each end of the shaft with compound angles, is a combination of the u-joint operating angle in the top view, as determined from the chart, and the measured u-joint operating angle in the side view.

To determine the true u-joint operating angle for one end of a shaft, (compound angle C° in the formula shown in figure below) insert the u-joint operating angle measurement obtained in the side view and the u-joint operating angle obtained from the chart into the formula.



a = 3.3° (True operating angle)

Do the same for the other end of the shaft. Compare the resultant calculated u-joint operating angle for each end. They should be EQUAL within 1°. If they are not, the driveshaft will vibrate.

# ELIMINATING COMPOUND ANGLE INDUCED VIBRATIONS

Compound u-joint operating angles are one of the most common causes for driveline vibration. To avoid thease problems, remember these important considerations:

When setting up an application that requires compound u-joint operating angles, always keep the centerlines of the transmission and pump parallel in both views.

Always keep the offset between their horizontal and vertical centerlines small.





#### NOTE

Centerlines of transmission and axle must be parallel in both top and side views to use this method of determining true u-joint operating angle.

Contact IMT Technical Support if you have an application which cannot be installed with parallel centerlines.

#### ANGLE SIZE

The magnitude of a vibration created by a u-joint operating angle is proportional to the size of the u-joint operating angle. IMT recommends true u-joint operating angles of 3° or less.

Obtain the true u-joint operating angle, as explained above, and if it is greater than 3°, compare it to the Driveshaft RPM/Maximum Operating Angle chart.

The angles shown on the chart are the MAXI-MUM u-joint operating angles recommended by IMT and are directly related to the speed of the driveshaft. Any u-joint operating angle greater than 3° will lower u-joint life and may cause vibration. Remember to check maximum safe driveshaft RPM as recommended by the driveshaft manufacturer.

DRIVESHAFT RPM	MAXIMUM OPERATING ANGLE
5000	3.2°
4500	3.7°
4000	4.2°
3500	5.0°
3000	5.8°
2500	7.0°
2000	8.7°
1500	11.5°



2-11

# **INSTALLATION - HYDRAULIC CRANE KIT (1)**

1.	51715358	HOSE/ADAPTER KIT	1
		(INCL:13-26)	
2.	72053145	PIPE NIPPLE 3/4NPT X 4	1
3.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	2
4.	72060049	CAP SCR 3/8-16X1-3/4 HHGR5	1
5.	72060118	CAP SCR 1/2-13X2 HHGR8	2
6.	72062103	NUT 3/8-16 LOCK	3
7.	72063003	WASHER 3/8 WRT	5
8.	72063053	WASHER 1/2 LOCK	2
9.	72063132	WASHER 1/2 FLAT HARD	2
10.	72532710	BEAD NIPPLE #20STR 1-1/4 90°	1
11.	72661202	CLAMP 3" CUSH LOOP	2
12.	72661350	CLAMP 3/4 CUSH LOOP 4TUBE	1

GE EF
EF
EF
'REF





#### NOTES:

1. The bulkhead reservoir should be mounted to the bulkhead of the body prior to the installation of the hydraulic fittings. If the fittings are installed on the tank, it will be impossible to install the tank on the bulkhead.

2. The filter is purchased separately as a required line item from IMT.

3. If this kit is used for a non-IMT installation, the suction strainer is the responsibility of the installer.

# **INSTALLATION - HYDRAULIC CRANE KIT (2)**



2-13

#### 2-14

#### **INSTALLATION - HYDRAULIC CRANE KIT (3)**



# HYDRAULIC SCHEMATIC (4)



# **INSTALLATION - COMPRESSOR HYD KIT (1)**

1.	51715357	HOSE/ADAPTER KIT (INCL:13-2)	7) 1
2.	72053145	PIPE NIPPLE 3/4NPT X 4	1
3.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	2
4.	72060049	CAP SCR 3/8-16X1-3/4 HHGR5	1
5.	72060118	CAP SCR 1/2-13X2 HHGR8	2
6.	72062103	NUT 3/8-16 LOCK	3
7.	72063003	WASHER 3/8 WRT	5
8.	72063053	WASHER 1/2 LOCK	2
9.	72063132	WASHER 1/2 FLAT HARD	2
10.	72532710	BEAD NIPPLE #20STR 1-1/4 90°	1
11.	72661202	CLAMP 3" CUSH LOOP	2
12.	72661350	CLAMP 3/4 CUSH LOOP 4TUBE	1
13.	51395171	HOSE-FJ 1/2X105 #8#8	1R
14.	51395172	HOSE-FJ 3/4X61 #12#12	1R
15.	72053558	ADAPTER 3/4MPT 3/4MPT	1R
16.	72053729	ADAPTER 1-1/4MPT 1-1/4MPT	1R
17.	72053763	ELBOW #8MSTR #8MJIC 90°	1R
18.	72066516	HOSE CLAMP 1-1/4 2-BOLT	2R
19.	72531427	ELBOW 3/4MPT #12MJIC 90°	2R
20.	72531550	BARB NIPPLE 1-1/4MPT 1-1/4	1R
21.	72531836	RED. BUSHING 1-1/4 - 3/4NPT	2R
22.	72532360	ADAPTER #12MSTR #8MJIC	1R
23.	72532949	ADAPTER #20MSTR #12FSTR	1R
24.	72532951	ADAPTER #12MSTR #8FSTR	1R
25.	73054230	BALL VALVE 3/4NPT	1R
26.	73054232	BALL VALVE 1-1/4NPT	1R
27.	89393401	HOSE 1-1/4 100R4	70"l



NOTE: ITEMS #25 AND #26 ARE SHOWN IN THE OPEN POSITION IN THIS VIEW.



NOTES:

1. The bulkhead reservoir should be mounted to the bulkhead of the body prior to installation of the hydraulic fittings. If fittings are installed on the tank, it will be impossible to install the tank on the bulkhead.

2. The filter is purchased as a required line item separately from IMT.

3. If this kit is being used for a non-IMT installation, the suction strainer is the responsibility of the installer.

2-17

# **INSTALLATION - COMPRESSOR HYDRAULIC KIT (2)**



1.) Refer to sheet #1 for the complete bill of material listing. Notes:

# COMPRESSOR HYD KIT (3)



#### **INSTALLATION - CRANE & COMPRESSOR HYD KIT (1)**

1.	51715356	HOSE/ADAPTER KIT (INCL:13-30	) 1						
2.	72053145	PIPE NIPPLE 3/4NPT X 4	, 1						
3.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	2						
4.	72060049	CAP SCR 3/8-16X1-3/4 HHGR5	1		DET	AIL "A"			
5.	72060118	CAP SCR 1/2-13X2 HHGR8	2						
6.	72062103	NUT 3/8-16 LOCK	3	$\sim$					
7.	72063003	WASHER 3/8 WRT	5			_			
8.	72063053	WASHER 1/2 LOCK	2		$\checkmark$				
9.	72063132	WASHER 1/2 FLAT HARD	2	0					
10.	72532710	BEAD NIPPLE #20STR 1-1/4 90°	1						
11.	72661202	CLAMP 3" CUSH LOOP	2				<		
12.	72661350	CLAMP 3/4 CUSH LOOP 4TUBE	1				$\rightarrow$		
13.	51395022	HOSE-FJ 1/2X246 #8#8	1REF				$\checkmark$		
14.	51395170	HOSE-FJ 1/2X180 #8#8	1REF		< ·				
15.	51395171	HOSE-FJ 1/2X105 #8#8	1REF			0			
16.	51395172	HOSE-FI 3/4X61 #12#12	1REF		_ A ∕_				
17.	72053558	ADAPTER 3/4MPT 3/4MPT	1REF		<u>∕</u> ₽́``				
18.	72053729	ADAPTER 1-1/4MPT 1-1/4MPT	1REF	~/					
19.	72053763	ELBOW #8MSTR #8MJIC 90°	1REF	(18)					
20.	72066516	HOSE CLAMP 1-1/4 2-BOLT	2REF			Ĭ			
21.	72531427	ELBOW 3/4MPT #12MJIC 90°	2REF	~ /	ĨĹ		$\mathbf{b}$		
22.	72531550	BARB NIPPLE 1-1/4MPT 1-1/4	1REF	(29)-/	UŞ		417		
23.	72531836	RED. BUSHING 1-1/4 - 3/4NPT	2REF		/~	_ n∥			
24.	72532360	ADAPTER #12MSTR #8MJIC	1REF			Ϋ́	(28)		
25.	72532950	TEE 1-1/16JIC SWVL-NUT-RUN	1REF	(22)					
26.	72532951	ADAPTER #12MSTR #8FSTR	1REF				<b>\_</b> (2)		
27.	72532972	ADAPTER #8MJIC #12FJIC	1REF <sub>NOTE:</sub>		(				
28.	73054230	BALL VALVE 3/4NPT	1REF ITEMS	#28 & #29	ARE		~23		
29.	73054232	BALL VALVE 1-1/4NPT	1REF <sup>SHOWN</sup>	IN THE OPEN	POSITION		0		
30.	51395545	HOSE 1-1/4 100R4 X 70	1REF			L \	<		
					Ø,			FILTER 7	3052091 REF
					_ /		23)		
					(27)-/		$\tilde{}$		
					-	425	<u>\</u> 21		



#### NOTES:

1. The bulkhead reservoir should be mounted to the bulkhead of the body prior to installation of the hydraulic fittings. If fittings are installed on the tank, it will be impossible to install the tank on the bulkhead.

2. The filter is purchased as a required line item separately from IMT.

3. If this kit is being used for a non-IMT installation, the suction strainer is the responsibility of the installer.

#### **INSTALLATION - CRANE & COMPRESSOR HYD KIT (2)**



#### 2-21

# **INSTALLATION - CRANE & COMPRESSOR HYD KIT (3)**



# **INSTALLATION - CRANE & COMPRESSOR HYD KIT (4)**



3

3

1

1

#### HYDRAULIC TELESCOPING CRANE-**ELECTRICAL INSTALLATION (99901294)**

1.	70394092	DECAL-CAUTION BRK/CMPRSR	1
2.	72050005	CAP SCR 1/4-20X1-1/4 HHGR5	3

- 3. 72062104 NUT 1/4-20 LOCK 3
- 4. 72063001 WASHER 1/4 WRT
- 5. 77041251 RELAY
- 6. 51715664 CABLE ASM 14GA X 35'
- FUSE HOLDER-CONNECTOR 7. 77041707
- 8. 77041708 FUSE HOLDER-COVER
- 1 2 9. 77041709 FUSE HOLDER-TERMINALS

NOTE: BODY SHOWN NOT TYPICAL.



## **ELECTRIC TELESCOPING CRANE-ELECTRICAL INSTALLATION (99903519)**

1.	70394092	DECAL-CAUTION BRAKE/COMP	1
2.	72050005	CAP SCR 1/4-20X1.25 HHGR5	1
3.	72062104	NUT 1/4-20 HEX NYLOC ZINC	1
4.	72063001	WASHER 1/4-FLAT	1
5.	77041251	RELAY	1
6.	77441074	HARNESS	1

6. 77441074 HARNESS

#### NOTE: BODY SHOWN NOT TYPICAL.





2

4

# 20013 COMPRESSOR - INSTALLATION DRAWING (99903524)

- 1. 60125134 BRACE, COMPRESSOR
- 2. 72060046 CAP SCR 3/8-16X1 HHGR5Z
- 3. 72062103 NUT 3/8-16 HEX NYLOC ZINC 4





- 1. Align braces (Item #1) with holes in inner wall. Keep braces tight against top panel, and hole 13.38" dimension.
- 2. Drill holes in front wall of sidepack, using braces as reference.
- 3. Mount braces using 3/8" hardware.
- 4. Drill 10.44" holes in roof, using braces as template.
- 5. Mount compressor using hardware supplied.