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www.imt.com

Manual # 99905542

TH20K167 PARTS & SPECIFICATIONS

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Section - 1 Introduction

TH20K167 - Introduction

This manual includes operation, safety, and maintenance instructions and replacement parts for your IMT Tirehand.

In addition to reading the manual, it is your responsibility to become familiar with government regulations, hazards, and the specific operation of your equipment. Use caution and common sense while operating and maintaining the equipment and follow all safety procedures and regulations. Treat this equipment with respect and service it regularly.

MODIFICATIONS

Modifications to your equipment must be performed with IMT approved accessories, parts and optional equipment. If in doubt, contact IMT prior to making any modifications. DO NOT alter or modify any safety device! All safety devices must be inspected, tested and maintained in proper working condition.

Decals regarding safety and operation are considered safety equipment, and must be kept clean and legible.

The equipment owner and/or designated employee is responsible for informing all operators, maintenance personnel, and others involved in equipment operation about the safe operation and maintenance of the equipment. If questions arise concerning safe operation, contact IMT or your IMT distributor for clarification.

WARRANTY

Warranty of this unit will be void on any part of the unit subjected to misuse due to overloading, abuse, lack of maintenance and unauthorized modifications. No warranty - verbal, written or implied - other than the official, published IMT new machinery and equipment warranty will be valid with this unit.

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 Technical Support at:

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

INTRODUCTION, CONTINUED

RESPONSIBILITY

It is the user's responsibility to maintain and operate this unit in a manner that will result in the safest working conditions possible. In addition, it is the user's responsibility to be aware of existing Federal, State, and Local codes and regulations governing the safe use and maintenance of this equipment.

MANUAL STRUCTURE

Throughout this manual, four means are used to draw the attention of personnel. They are NOTE, CAUTION and WARNING and DANGER and are defined as follows:

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 the very 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.

DANGER

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Danger is used in the extreme situations.

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Section - 2

Specifications

TH20K167 - Specifications

| GENERAL SPECIFICATIONS | | |
|---|--|--|
| Tirehand maximum capacity | 20,000 lb (9072 kg) | |
| Body rotation | 100° | |
| Pad rotation system | 360° | |
| Tirehand weight (forklift mounted) | 10,200 lb (4627 kg) | |
| Tirehand weight (loader mounted) | 13,000 lb (5897 kg) | |
| Clamping span | 50" To 167" (127 to 424 cm) | |
| HORIZONTAL CENTER OF GRAVITY I | FROM VEHICLE ATTACHMENT POINT: | |
| Forklift-mounted Tirehand with 10,000 lb (4536 kg) tire & rim assembly at 131" (333 cm) clamp opening | 87.70" (223 cm) | |
| Loader-mounted Tirehand with 10,000 lb (4536 kg) tire & rim assembly at 131" (333 cm) clamp opening | 93.63" (238 cm) | |
| Method of clamping | Parallelogram | |
| Clamping load holding valves | Counterbalance valve | |
| Hydraulic control valve | Located on base assembly | |
| Hydraulic controls | 5-Function remote control (radio or cab-mounted) | |
| Optimum pump capacity (supplied from carrier vehicle) | 12 U.S. gpm <i>(45.4 Lpm)</i> @ 3000 psi <i>(207 bar) (57 Lpm</i> @ <i>207 bar)</i> | |
| Counterweight needed | As required for stabilization | |

STANDARD FEATURES:

- 1. Hydraulic fallback protection
- 2. Rim flange hardware on pads
- Forklift or loader mounting

OPTIONAL FEATURES:

- 1. Electric controls
- Lateral shifting capabilities

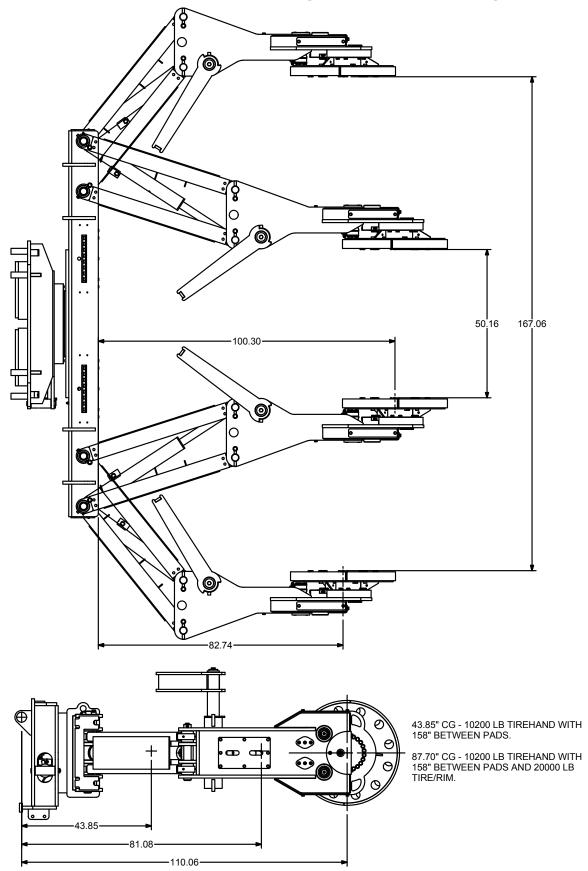
VEHICLE COMPATIBILITY

The Tirehand TH20K167 will permanently adapt to either a forklift truck or a front-end loader. When mounting to a forklift truck, it is recommended that the truck be equipped with a side-shifter. If adapted to a front-end loader, quick couplers are available which enable the disconnection of the Tirehand so that the original bucket can be quickly coupled to the machine for normal operations.

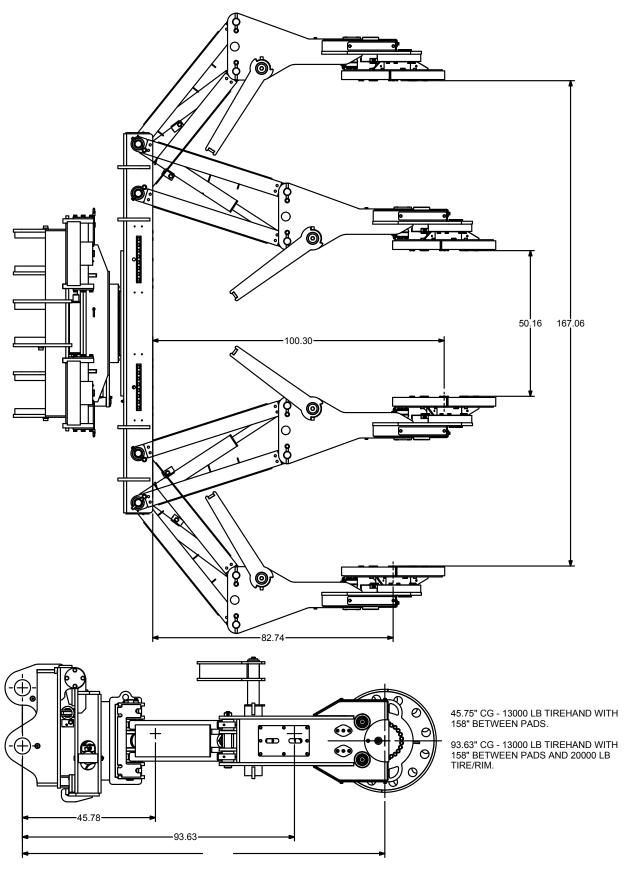
IMT reserves the right to change specifications and design without notice. Where applicable, specifications are in accordance with SAE standard and ISO/DIS 3691-1, the international standard for Industrial Trucks - Safety Requirements and Verification.

IOWA MOLD TOOLING CO., INC. BOX 189, GARNER, IA 50438-0189 TEL: 652-923-3711 FAX: 641-923-2424

TH20K167 - Dimensional Drawing, Forklift Mounting



TH20K167 - Dimensional Drawing, Loader Mounting



TH20K167 - Recommended Spare Parts

| PART NO. | TH15K160 DESCRIPTION | QTY. |
|----------|---|------|
| 40725220 | SPARE PARTS LIST TH10K - TH20K | 1 |
| 60020167 | BUSHING-BRZ 2.50X 3.00X 3.75 | 16 |
| 60020181 | BUSHING-B148 ROTATION | 2 |
| 60020182 | BUSHING-B148 ROTATION | 2 |
| 60020246 | BUSHING-BRZ 1.50X 2.25X 0.94 | 2 |
| 60020247 | BUSHING-BRZ 1.50X 2.25X 1.00 | 2 |
| 60030253 | WEAR PAD-SIDE SHIFTER TH2557B | 1 |
| 60106309 | GEAR-DRIVE 1.875 PD X 3.75 LG | 2 |
| 70034283 | GEAR-INTMD 301-10103-1 | 8 |
| 71056264 | GEAR-PINION 301-10104-1 | 2 |
| 71056265 | GEAR-TRNTBL BRG 449-05190-1 | 2 |
| 71056389 | GEAR-TRNTBL BRG 449-05190-1 | 2 |
| 71056676 | GEAR-TRNTBL BRG-TH20K 450-05327-1 | 1 |
| 71415014 | KEEPER-PIN .38 | 6 |
| 71415017 | KEEPER-PIN .75 | 8 |
| 73054242 | VALVE-CBAL 25GPM (5:1) | 4 |
| 73540565 | VALVE-CBAL 15 GPM 4.5:1 T11-A @4000 PSI | 2 |
| 73511285 | MOTOR ASM W/CBAL VALVE | 2 |
| 9b015930 | SEAL KIT-IMT 4.02B 2.00R 1.44S | 2 |
| 60122735 | BUSHING-3.50 X 4.25 X 4.00 | 4 |
| 72601624 | CAP SCR .75-10X 6.00 HH GR8 Z | 11 |
| 72534888 | ADPTR-M JIC/F JIC 8 8 0.062 ORIFICE | 2 |
| 71415915 | SEAL KIT FOR 51724677 | 1 |
| 70055402 | BEARING-POLYGON PWR24M28-44 | 1 |
| 70055370 | BEARING-POLYGON PWR24M28-32 | 2 |
| 94399967 | SEAL KIT - JARP 432126B | 2 |
| 9c160920 | SEAL KIT-IMT 4.02B 2.50R 1.44S | 2 |

TH20K167 - Capacity Chart



MAX: 167" (424 cm)

Section - 3

Assemblies & Installations

TH20K167 - Installation Introduction

VEHICLE COMPATIBILITY

The Tirehand will permanently adapt to either a forklift truck or a front-end loader which has sufficient capacity and stability, per the Tirehand specifications. When mounting to a forklift truck, it is recommended that the truck be equipped with a side shift. If adapted to a front-end loader, quick couplers are available which enable the disconnection of the Tirehand so that the original bucket can be quickly coupled to the machine for normal operations.

Typical Tirehand hydraulic installations include:

- Bulkhead plate hydraulic installation all of the Tirehand hydraulics hoses connect together in a bulkhead plate, which then connects hydraulically to the loader or forklift. With a bulkhead plate installation, the valve bank is part of the forklift or loader rather than the Tirehand. In many cases, bulkhead installations are used on forklifts.
- 2. Valve bank hydraulic installation when the valve bank is part of the Tirehand, rather than the loader or forklift. The forklift or loader must be equipped with a pressure line and a return line which connects the forklift or loader hydraulic system to the valve bank in the Tirehand. In many cases, valve bank hydraulic installations are used on loaders.

Typical Tirehand controls include:

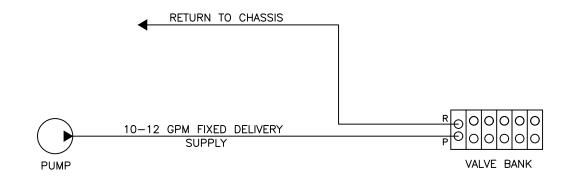
- 1. Hydraulic cab controls, where additional functions in forklift or loader control valves are hydraulically connected to the Tirehand.
- 2. Electric cab controls, which includes a control box with toggles used to control the Tirehand.
- 3. Radio remote controls.

For all installations, the Tirehand requires 12 gpm (45.4 Lpm) of hydraulic fluid at 3000 psi (207 bar). A flow divider may be required if the forklift or loader pump provides excess flow. Contact IMT for specific installation instructions on any type of installation.

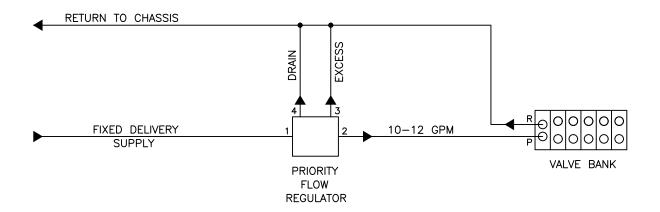
Prior to connecting any electrical connections between the Tirehand and the loader or forklift, check the Tirehand voltage. IMT Tirehand may be 12V or 24V.

TH20K167 - Hydraulic Installation

PREFERRED INSTALLATION:



ALTERNATE INSTALLATION:



TH20K167 - Loader Installation

NOTE: Tirehand installations vary based on the carrier vehicle. Contact IMT for specific installation assistance.

- 1. Mount the Tirehand to loader arms using the original loader pins.
- Splice the flow control divider into the existing pressure line. Continue the original line to its original
 destination (bucket, etc.), and route the controlled line with 12 gpm (45.4 Lpm) 3000 psi (207 bar) to the
 Tirehand valve bank.
- 3. Route the hoses as shown in figure below.
- 4. Locate the control handle inside the cab where convenient to operate.
- 5. Connect the 3-wire power cable to 12-volt power. The green wire connects to 12V positive, the black wire to the coil on the flow divider, and the white wire to ground.
- 6. Route the control cable to the Tirehand and connect.
- 7. Check all hoses and cables for clearances. Make sure that steering or moving the arms will not pinch or over-stress the hoses or cables.
- 8. Fill the reservoir. Start the loader's engine and operate all controls to purge air from the system. With the loader running, check for leaks and repair if necessary.
- 9. Recheck all hoses and cables for clearance.
- 10. Check the reservoir oil level and fill if necessary.
- 11. Test operate the Tirehand.

NOTE

Stop blocks should be welded to the loader arms to limit articulation. If necessary locations and sizes of stops to be determined at time of installation.

Assemblies & Installations 15 Section - 3

TH20K167 - Lift Truck Installation

- 1. Mount the Tirehand to lift truck using the original carriage pin.
- 2. Splice the flow control divider into the existing pressure line. Continue the original line to its original des tination (forklift function, etc.), and route the controlled line (with 12 gpm (45.4 Lpm) at 3000 psi (207 bar) to the Tirehand valve bank.
- 3. Route the hoses as shown in figure below.
- 4. Locate the control handle inside the cab where convenient to operate.
- 5. Connect the 3-wire power cable to 12-volt power. The green wire connects to 12V positive, the black wire to the coil on the flow divider, and the white wire to ground.
- 6. Route the control cable to the Tirehand and connect.
- 7. Check all hoses and cables for clearances. Make sure that steering or other movements of the lift truck will not pinch or overstress the hoses or cables.
- 8. Fill the reservoir. Start the lift truck's engine and operate all controls to purge air from the system.
- 9. With the lift truck running, check for leaks and repair if necessary.
- Re-check all hoses and cables for clearance.
- 11. Check the reservoir oil level and fill if necessary.
- 12. Test operate the Tirehand.

TH20K167 - Bulkhead Installation

If the forklift on which the Tirehand is installed includes control valves, all of the hydraulic lines from the forklift control valves must culminate at the front of the carriage. The forklift will connect to the Tirehand using a bulkhead plate. The forklift manufacturer must furnish oil for all hydraulic functions. Install the Tirehand with a bulkhead plate as follows:

- 1. Install the Tirehand on the forklift, using the bulkhead plate for hydraulic connections. Use the required hydraulic fluid flow at the correct pressure, per the Tirehand specifications.
- 2. Check lubrication points for adequate lubrication.
- 3. Operate the forklift to check for vertical obstructions.

TESTING

- 1. Raise the Tirehand to provide adequate clearance for operating all Tirehand functions. Operate all Tirehand functions and check for leaks.
- 2. Test the unit at rated capacity. Note any points of instability. Add counterweights if needed.

If the carrier vehicle is articulating, make certain that steering of the vehicle is not hindered by the routing of the hydraulic hoses. Check for wear points and re-route if needed.

NOTE

IF THE TIREHAND OPERATION IS ERRATIC, PURGE AIR FROM THE HYDRAULIC SYSTEM.

A WARNING

AVOID SERIOUS INJURY! KEEP CLEAR OF ALL PINCH POINTS WHILE OPERATING THIS UNIT.

TH20K167 - Valve Bank Installation

When the Tirehand has a valve bank, connect the valve bank to the forklift or loader hydraulic system using the hydraulic pressure and return line from the forklift or loader.

- 1. Install the Tirehand on the loader or forklift, connecting the suction and return lines from the forklift or loader to the Tirehand valve bank. See the hydraulic layout drawing in the parts manual for hydraulic information for a valve bank installation.
- 2. Check lubrication points for adequate lubrication.
- 3. Operate the forklift or loader to check for vertical obstructions. Add stop blocks, if needed, to prevent the Tirehand from contacting the carrier vehicle.

TESTING

- 1. Raise the Tirehand to provide adequate clearance for operating all Tirehand functions. Operate all Tirehand functions and check for leaks.
- 2. Test the unit at rated capacity. Note any points of instability. Add counterweights if needed.

If the carrier vehicle is articulating, make certain that steering of the vehicle is not hindered by the routing of the hydraulic hoses. Check for wear points and re-route if needed.

NOTE

IF THE TIREHAND OPERATION IS ERRATIC, PURGE AIR FROM THE HYDRAULIC SYSTEM.

A WARNING

AVOID SERIOUS INJURY! KEEP CLEAR OF ALL PINCH POINTS WHILE OPERATING THIS UNIT.

TH20K167 - Operator Training

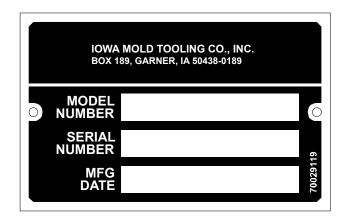


Prior to operating the Tirehand, read and follow the manual and all warning and safety decals. The Tirehand is designed for operator simplicity. Prior to operating this unit, the operator should become thoroughly familiar with the controls, operating procedures, and safety precautions.

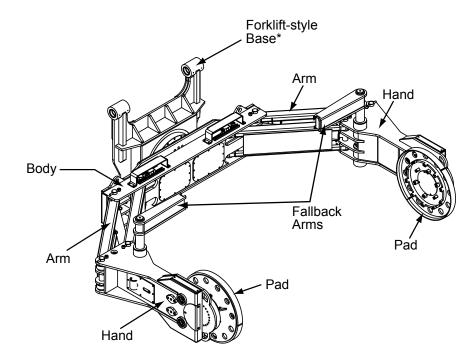
TH20K167 - Intended Use and Identification

This Tirehand is a tire lifting and positioning device. It should be used to remove, transport, replace, and storage stack tires. It is designed only as a tire handling device and should not be used for any other purposes. It is intended to permanently attach to either a forklift truck or a front-end loader.

This Tirehand has an identification placard, as shown below, fastened to the body assembly. When ordering parts, communicating warranty information, or referring to the unit in any way, always include the assigned model and serial numbers. All inquiries should be directed to Iowa Mold Tooling Co., Inc., 500 Highway 18 West, Garner, Iowa 50438, U.S.A.



TH20K167 - Component Identification



NOTE: * Forklift-style base shown. See parts section for all base options.

TH20K167 - Equipment Inspection

Before using, the operator should inspect as listed:

| ITEM | DESCRIPTION | FREQUENCY | |
|-------------------------------|---|-----------|--------|
| I I ⊏IVI | DESCRIPTION | DAILY | WEEKLY |
| WALK- AROUND INSPECTION | Inspect for hydraulic leaks, loose parts and obvious structural member damage. | | |
| ROTATION SYSTEM | Check for excessive backlash (play) between pinion gear and turntable gear-bearing. If there is excess play, use a feeler gauge to measure the play and service the Tirehand if needed. | | |
| ELECTRICAL | Check remote controls, auxiliary lighting, etc. for proper function. | | |
| | Check for deterioration, dirt and moisture. | | |
| HYDRAULIC | Check for leaks on surface and at ends. | | |
| HOSE | Check for blistering, deformation and abrasion. | | |
| CONTROL VALVES | Check for leaks, cracks and slow return to neutral. | | |
| CARRIER VEHICLE | Follow all inspection procedures provided by the carrier vehicle manufacturer. | | |

In addition, the Tirehand requires periodic inspection as noted in the maintenance section. Use the inspection chart in the maintenance section to determine critical inspection tasks.

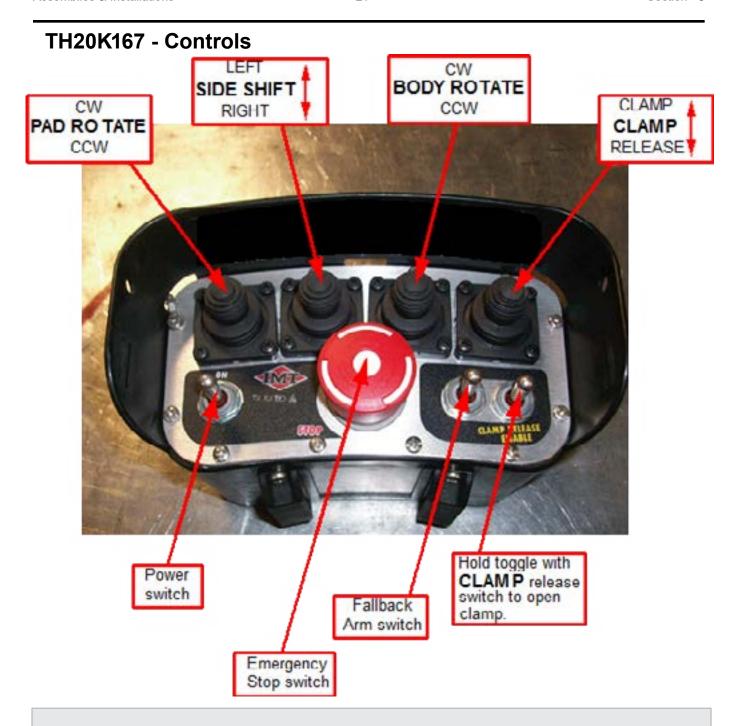
TH20K167 - Work Station Positioning

Before using the Tirehand, set the work area up correctly.

- Operate this equipment on a firm, level, and dry surface.
- Avoid overhead obstructions.
- Keep unauthorized personnel clear of the work area before beginning work.
- When the job site terrain is graded or soft, exercise extra caution.

A WARNING

Avoid injury! The operator is responsible for being aware of unauthorized personnel in the work area. Suspend operations until the work area is cleared.



NOTES: See the Tirehand, *Radio Remote System*, IMT manual #99905678, for complete radio remote control system instructions. The Tirehand radio remote control is a cab-mounted or tethered remote with a radio option.

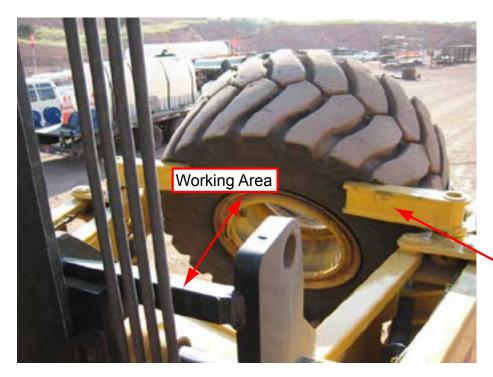
TO OPERATE:

- Power up the remote using the power switch.
- Use the fallback arm switch to activate the fallback arms prior to lifting a tire.
- Use the desired function to manipulate the tire.
- To release a clamped tire, hold the clamp toggle switch while operating the clamp release joystick. This prevents tires from being inadvertently released.

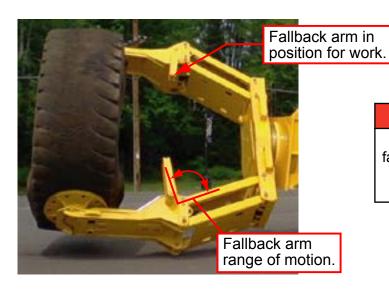
TH20K167 - Fallback Arms

The Tirehand is equipped with fallback arms to prevent tire movement toward the working area between the tire and the back of the Tirehand. When deployed, the fallback arms are positioned perpendicular to the arm assembly to prevent the tire from falling into the work area. They need to be positioned in-line with the arm assembly when rotating the tire.

The hydraulic assembly for the fallback arms includes a holding valve to prevent the fallback arm from being forced open in case of an unexpected force from the tire or another object.



Fallback Arms must be deployed when personnel are in the working area between the tire and the carrier vehicle.



DANGER

DO NOT enter the work area unless the fallback arms are deployed! Use the fallback arms when people are in the work area to create a safe work environment.

TH20K167 - Task Performance

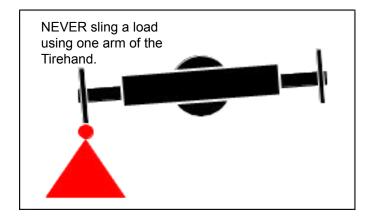
To begin operation:

| ITEM NO. | | | |
|----------|--|--|--|
| 1. | Open Tirehand clamps. | | |
| | Maneuver the vehicle into a position so that the Tirehand can be used to clamp the center of the tire with the Tirehand body parallel to the ground. | | |
| 2. | Make certain personnel are clear before continuing the operation. | | |
| | Advance the carrier vehicle and center the clamp pads on the tire. Clamp tire securely. | | |
| 3. | | | |
| 4. | | | |
| 5. | Remove tire and rim hardware, if needed. Following tire and rim manufacturer instructions, carefully remove the tire and / or rim from the vehicle. To transport tire, rotate so that tire is in horizontal position and close to the ground. If possible, keep the lowest part of the tire approximately 12" (305 mm) from the ground. Tire is positioned parallel and low to the ground for transport. WARNING If the tire is in a vertical position, the tire blocks operator visibility during transport. DO NOT transport tire in this position! Rotate the pads so that the tire is in a horizontal position, parallel to the ground, before transporting. It is the operator's responsibility to position the tire and tirehand for maximum visibility when transporting the tire. | | |

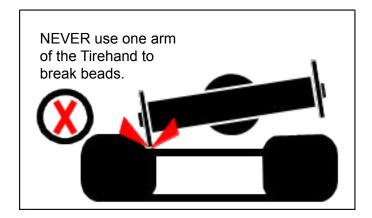
| ITEM NO. | OPERATION / DESCRIPTION |
|----------|---|
| | Place tire-per tire manufacturer recommendations. |
| 6. | Avoid equipment damage! Never drag or push tire. Make sure the tire is lifted off the ground before moving it. |
| 7. | To reinstall tire, rotate pads so the tire is in a vertical position, perpendicular to the ground and rotate the body so it is parallel to the ground. A CAUTION Clamp pressure can change as the tire rotates and the weight shifts on the clamps. Observe clamp pressure and adjust if needed. Watch clamp pressure when body is rotates, the tire weight will shift to the lower clamp pad. Vertical tire in horizontal position for tire installation |
| 8. | Clamp the tire securely. Remember, clamp pressure changes as the weight shifts between the clamps. When the tire is vertical, the fallback arms, a safety device in case of operator error, will prevent the tire from falling into the space between the clamp and the body. Make sure the fallback arms are engaged when the tire is in the vertical position. Fallback arms prevent tire slippage toward tirehand body. Clamp arms hold tire in vertical position. |
| 9. | To reinstall a tire, maneuver the forklift or loader so that the Tirehand can be used to position the tire back onto the carrier vehicle. Raise the loader or forklift so the tire is elevated correctly. When the tire is in position and secured properly per the tire, rim, and vehicle manufacturer recommendations, release the Tirehand clamps. |

TH20K167 - Operating Restrictions

The Tirehand is intended to be a tire lifting and positioning device. There are possible misapplications of this machine that can cause serious damage to the Tirehand rotation gears. It is possible to break the teeth on the Tirehand rotation bearing by applying forces while attempting to break tire beads with one arm of the Tirehand, or by slinging a load under one arm of the Tirehand. Use of a single Tirehand arm for lifting or carrying a load will void the tire hand warranty.



The rotation system on the Tirehand is designed to allow the user to manipulate large tires. It is a precision function that was not designed to apply high loads. However, the load holding valves that are built into this system to help control the tire during handling will also prevent the body of the Tirehand from rotating freely when loads are applied to a single Tirehand arm. When one arm is used for bead breaking, these forces can translate into torques that attempt to rotate the body of the Tirehand. The load holding valves will not allow this to occur. In this situation, the forces that are created in the Tirehand rotation turntable are well in excess of what the gear teeth can tolerate. Using one arm of the Tirehand for bead breaking will void the warranty of the Tirehand



A bead breaker must be used to separate the tire from the rim. It is acceptable to use the Tirehand for holding the sidewall and flange away from the bead while o-rings and locking rings are being installed.

TH20K167 - Electrical Safety

Keep away from power lines! If you must operate the Tirehand near powerlines:

- For lines rated 350 kV or below, keep a minimum clearance of 20' (6.1 m) between the lines and any part
 of the Tirehand or load.
- 2. For lines rated over 350kV, keep a minimum clearance between 50' (15.25 m)
- 3. In transit, keep a minimum clearance of 4' (1.22 m)
- 4. Use a signal person to observe the clearance and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

TH20K167 - Warnings

Warning decals are installed on the Tirehand, as well as on the loader or forklift, to give information about possible hazards. All decals must be installed and legible. If decals are damaged, they must be replaced. Refer to the parts section for the decal part numbers and locations on the Tirehand.



FAILURE TO OBEY THE FOLLOWING WILL RESULT IN

DEATH OR SERIOUS INJURY,

INSTABILITY OR EQUIPMENT DAMAGE

- ALWAYS use this unit for removing, transporting, replacing and storage stacking of tires specified.
- ALWAYS use this unit as a tire handling device ONLY.
- ALWAYS keep load in position low to ground and backward (upward) tilted when transporting to ensure maximum vehicle stability.
- ALWAYS travel and operate at reasonable speeds.
- ALWAYS transport tires with arms rotated in a plane parallel (horizontal) to the ground.
- ALWAYS check the security of clamping action when rotating a load to a position perpendicular to the ground.

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TIREHAND WARNINGS, CONTINUED



FAILURE TO OBE Y THE FOLLOWING
WILL RESULT IN

DEATH, SERIOUS INJURY, INSTABILITY OR EQUIPMENT DAMAGE

NEVER attempt to handle tires filled with ballast. Stability or structural failure may result if load limit is exceeded.



NEVER drag the tire - the unit is designed to lift and carry.



NEVER transport a tire rotated more than 30° off the horizontal plane.

FOR EXAMPLE: Do not transport in a vertical plane.



NEVER use the unit for any jacking, pulling or dragging operation involving an object or another vehicle.



NEVER impact-load or hammer-push with the unit.



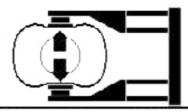
NEVER operate hand below ground level.



NEVER operate the unit while persons not required for operation are in the work area.



NEVER clamp an uninflated tire and then inflate. Damage or injury WILL result.

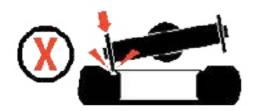




NEVER sling a load using one arm of the Tirehand.



NFVFR use one arm of the Tirehand to break beads.



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Section - 4 Maintenance

TH20K167 - Maintenance Introduction

Proper, regularly scheduled maintenance is essential in keeping your Tirehand at peak operating efficiency. This section outlines maintenance information and service intervals. Personnel responsible for Tirehand maintenance should familiarize themselves with the service intervals and maintenance operations described.

Following the designated lubrication procedures is important in providing maximum Tirehand life. The procedures and lubrication charts in this section include information on the types of lubricants used, location of lubrication points and frequency of lubrication. Information concerning the lubrication requirements of the truck chassis is not included. Refer to the appropriate truck manufacturer's manuals for chassis lubrication requirements.

The service intervals specified are for normal operation where moderate temperatures, humidity and atmospheric conditions prevail. In areas of extreme conditions, the service periods and lubrication specifications should be altered to meet those conditions. For information concerning extreme condition lubrication, contact your local service representative.

Note: The service schedule in this manual pertains only to the IMT Tirehand. In addition to Tirehand maintenance, it is your responsibility to follow all inspection and maintenance procedures for the forklift or loader, as defined in the forklift or loader maintenance manual.

TH20K167 - Lubrication Points

| LUBRICATION CHART | | | |
|---------------------------------|--------------------|------------------------|----------|
| APPLICATION POINT | LUBRICATION | APPLICATION | INTERVAL |
| Side Shift Pins (if applicable) | | | |
| Body - Arm Link Pins (Top | | | |
| & Bottom, both sides) | | | |
| Arm / Hand Link Pins (Top | Shell Alvainia 2EP | | |
| & Bottom, both sides) | or | Hand Grease Gun | |
| Pad Rotation Gear | Shell Retinax "A" | or | Weekly |
| Pad Pinion Gear | or Equivalent | Pnuematic Pressure Gun | |
| Body Rotation Turntable | · | | |
| Gear | | | |
| Body Drive Gear | | | |
| Body Pinion Gear | | | |

TH20K167 - Hydraulic System

Whenever disconnecting a hydraulic component:

- ALWAYS relieve internal hydraulic pressure before proceeding with the repair.
- 2. **NEVER** allow foreign matter dirt, water, metal particles, etc. to enter the hydraulic system through the open connection. Seal the connection as tightly as possible. If dirt does get in, a filter change is required after about 50 hours of operation.
- **3. ALWAYS** cycle all of the controls after completing a repair. This will eliminate trapped air and prevent bumpy, erratic behavior during actual working conditions.
- **4. ALWAYS** check for hydraulic leaks after a repair. A high pressure leak is hazardous and must be repaired before putting the unit to work.

TH20K167 - Purging Trapped Air

Air can be introduced into the system from a leak or when a hydraulic component is disconnected for servicing. Air in the system will cause erratic operation and must be corrected.

To purge air from the system, extend and retract the affected cylinder several times. At the end of the stroke, hold the valve open for a few seconds. Repeat this procedure until operation is smooth and continuous

TH20K167 - Preventative Maintenance

The Tirehand Inspection Checklist is designed to assist in keeping the Tirehand in peak operating condition. The information in this section refers to the Tirehand only. Items which apply to your Tirehand should be checked before it is put into operation. Inspect to the frequency indicated in the chart. Consult the manufacturer's service guide for information on the carrier vehicle.

REGULAR INSPECTION

Every three months, or more often when the equipment is subjected to heavy use, complete the following inspections in addition to the preventative maintenance checklist.

TIREHAND ARM ASSEMBLIES

- 1. Check for structural defects such as weld cracks, dents, or bends.
- Check cylinder holding valves.
- Check cylinders for leaks.
- 4. Check both internal and external clamping arm bearings for wear and lubrication.
- 5. Check operating timing. Both clamping arms should function together at the same rate of motion.

AXIAL PAD ROTATION

- 1. Check for structural defects.
- 2. Check motors for leaks.
- Check disc bearings located on support shafts.
- Check all pins, and their retainers.

CYLINDERS

- 1. Check rods for damage such as scarring. Check for rust on out of service units.
- 2. Check for weld joint and seal leaks.
- 3. Check for drift, indicating possible leakage around the piston.
- Check cylinder case for cracks and dents.

HYDRAULIC PUMP

- Check for leaks at shaft seal and section joints.
- 2. Check for drop in operating speed.
- Check hydraulic oil for excessive heating.
- 4. Check bolts and fasteners for tightness and note unusual vibration or noise.

HYDRAULIC CONTROL VALVES

- Check spools for sticking and failure to return to neutral position. Inspect for leaks at joints and spools.
- 2. Inspect valve housing for cracks.
- 3. Make certain relief valve reaches the proper relief setting.

HYDRAULIC OIL RESERVOIR AND HOSES

- Check filters for clogged elements.
- Check oil level in the reservoir.
- Check all hoses for damage.



CARRIER BOOM AND CYLINDERS

- 1. Check for structural defects, such as dents, bends, and weld cracks.
- 2. Check all pins and their retainers.
- 3. Check cylinder rods for damage, and check for leaks.

SIDE SHIFT ASSEMBLY

- Check cylinder for leaks and damage.
- 2. Check linear bushings for damage and lubrication.
- Check for structural defects.
- 4. Check cylinder retaining pins.

ROTATION ASSEMBLY

- 1. Check gear box for proper anchoring and bolt torque.
- 2. Check gear-bearing bolt torque.
- 3. Check pinion gear/gear-bearing backlash.

TH20K167 - Inspection Chart

| | DECORPTION. | | FREQUENC | CY |
|---------------------------------|---|-------|----------|---------|
| ITEM | DESCRIPTION | DAILY | WEEKLY | MONTHLY |
| WALK-AROUND INSPECTION | Inspect for hydraulic leaks, loose parts and obvious structural member damage. | | | |
| *MOUNTING BOLTS | Check torque (power-wrench tight). | | | |
| ROTATION SYSTEM | Check for excessive backlash (play) between pinion gear and turntable gear-bearing. If there is excess play, use a feeler. gauge to measure the play and adjust the | | | |
| | backlash if needed. See the parts manual for clamp and body backlash specifications. | | | |
| *STRUCTURAL DAMAGE | Check for broken welds, fatigue cracks, structural defects, bends and dents. | | | |
| CONTROLS | Check for excessive wear and cleanliness. | | | |
| LEAKAGE | Check for hydraulic fluid leaks. | | | |
| *ROTATION SYSTEM MOUNTING BOLTS | Check torque of top and bottom gear-bearing bolts. (See Torque Data Chart) | | | |
| ELECTRICAL | Check remote controls, auxiliary lighting, etc. for proper function. | | | |
| | Check for deterioration, dirt and moisture. | | | |
| HYDRAULIC FLUID RESERVOIR | Check for proper oil level. (Carrier Vehicle) | | | |
| HYDRAULIC OIL | Check oil quality. (Carrier Vehicle) | | | |
| | Check for leakage on surface and at ends. | | | |
| HYDRAULIC HOSE | Check for blistering, deformation and abrasion. | | | |
| PUMP AND MOTOR | Check for loose bolts, leaks, unusual noises, vibration, reduced operating speed and excessive oil heating. | | | |
| HYDRAULIC FILTER | Check vacuum reading with engine running and PTO engaged. A vacuum of 8" of mercury or higher indicates an obstructed filter. (Carrier Vehicle) | | | |
| CONTROL VALVES | Check for leaks, cracks and slow return to neutral. | | | |
| *CYLINDERS | Check for leaks, scores, nicked or dented rods, dented cases, deformed pin bosses, rust on rod. | | | |
| CARRIER VEHICLE | Follow all inspection and maintenance procedures provided by the carrier vehicle manufacturer. | | | |
| * INDICATES A CRITIC | CAL ITEM | | | |

Parts 35 Section - 5

Section - 5 Parts

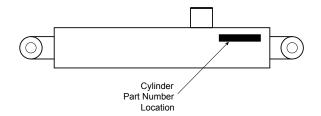
TH20K167 - Parts Ordering Information

GENERAL

This section contains the exploded parts drawings, with accompanying parts lists, for the assemblies used on the Tirehand. These drawings are intended to be used for ordering parts only.

CYLINDER IDENTIFICATION

To ensure proper replacement parts are received, it is necessary to specify the complete number/letter sequence for any part request. You must include the part number stamped on the cylinder case when ordering parts



WELDMENT IDENTIFICATION

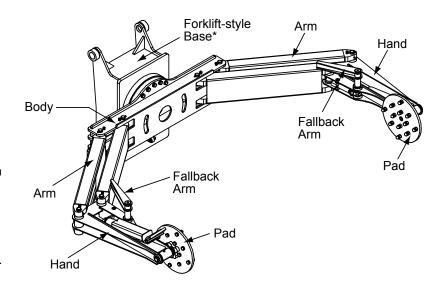
Each of the major weldments on the Tirehand bears a stamped part number. Any time a major weldment is replaced, you must specify the complete part number as stamped on the weldment. The locations of the part numbers are as shown below.

ORDERING REPAIR PARTS

When ordering replacement parts:

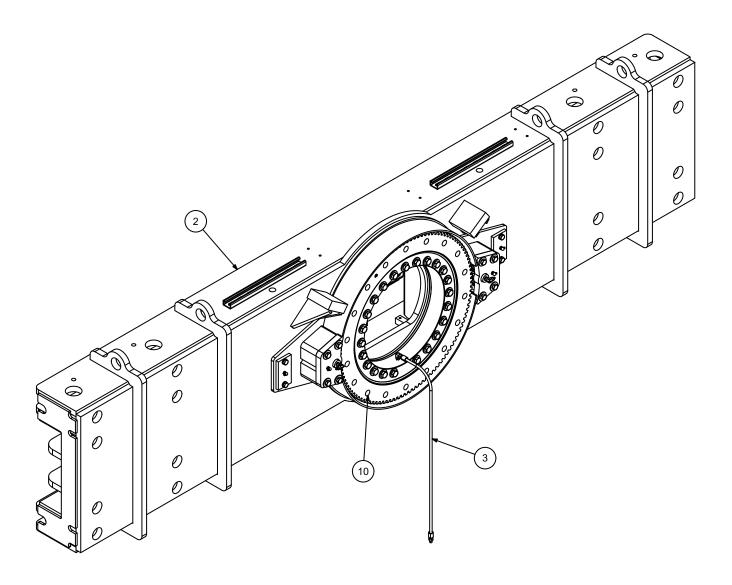
- Give the model number of the unit.
- 2. Give the serial number of the unit.
- Specify the complete part number. When ordering cylinder parts, or one of the main weldments, always give the stamped part number.
- 4. Give a complete description of the part.
- Specify the quantity required.

^{*} Forklift style base shown in picture.



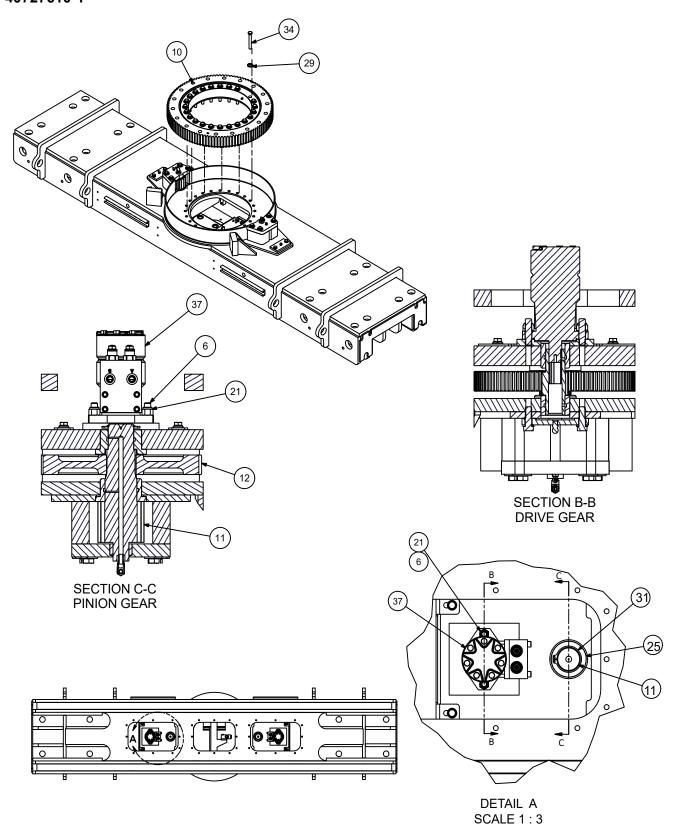
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TH20K167 - Body Assembly Motor Rotation (40727610)



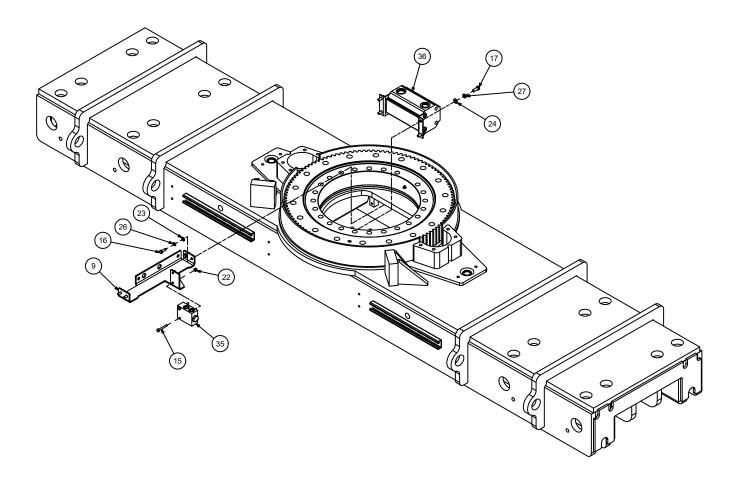
| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|-----------|----------|--|---------|------|
| 1. | 52727608 | WLDMT-MOTOR COVER TH20K | | 2 |
| 2. | 52727609 | BODY-WLDMT TH20K MOTOR ROT | | 1 |
| 3. | 53000713 | GREASE EXT-38.00 OAL 36.00HOSE | | 1 |
| 4. | 60010844 | GREASE PLATE-DRIVE GEAR | | 2 |
| 5. | 60105964 | SUPPORT PLT-PINION | | 2 |
| 6. | 60106032 | STUD50-13X1.75 | 39 | 4 |
| 7. | 60145886 | COVER PLATE- BODY TH20K | | 1 |
| 8. | 52727913 | WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE | | 2 |
| 9. | 60145888 | BRACKET-BULKHEAD MOUNT TH20K | | 1 |
| 10. | 70055409 | GEAR-TURNTABLE BEARING TH20K | | 1 |
| 11. | 71056073 | GEAR-PINION 301-10052-1 | | 2 |
| 12. | 71056264 | GEAR-INTMD 301-10103-1 | | 2 |
| 13. | 72053508 | ZERK-NPT .12 | 38 | 2 |
| 14. | 72053561 | ZERK-NPT .12X90 DEG | 38 | 4 |
| 15. | 72060008 | CAP SCR .25-20X 2.00 HH GR5 Z | 39 | 2 |
| 16. | 72060025 | CAP SCR .31-18X 1.00 HH GR5 Z | 38 | 4 |
| 17. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 38, 39 | 16 |
| 18. | 72060092 | CAP SCR .50-13X 1.25 HH GR5 Z | 38 | 12 |
| 19. | 72060101 | CAP SCR .50-13X 5.00 HH GR5 Z | 38 | 24 |
| 20. | 72060117 | CAP SCR .50-13X 1.50 HH GR8 Z | 38 | 4 |
| 21. | 72062080 | NUT .50-13 HEX NYLOCK | 38 | 4 |
| 22. | 72062104 | NUT .25-20 HEX NYLOCK | 39 | 2 |
| 23. | 72063002 | WASHER .31 FLAT | 38 | 4 |
| 24. | 72063003 | WASHER .38 FLAT | 38, 39 | 16 |
| 25. | 72063039 | MACHY BUSHING 2.00X10 GA NR | 38 | 2 |
| 26. | 72063050 | WASHER .31 LOCK | 38 | 4 |
| 27. | 72063051 | WASHER .38 LOCK | 38, 39 | 16 |
| 28. | 72063053 | WASHER .50 LOCK | 38 | 40 |
| 29. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 38 | 23 |
| 30. | 72063117 | WASHER .56 FLAT ASTM F436 | 38 | 8 |
| 31. | 72066095 | RETAINING RING-EXT 2.00 STD | 38 | 2 |
| 32. | 72531130 | ELBOW-STREET STL .12 X 90 DEG | 38 | 1 |
| 33. | 72601144 | CAP SCR .56-12X 2.00 HH GR8 Z | 38 | 8 |
| 34. | 72602089 | CAP SCR .62-11X 4.75 HH GR8 Z | 38 | 23 |
| 35. | 73054614 | FLOW DIV-COMB-FD50-45-8DD-N-66 | 39 | 1 |
| 36. | 73054829 | FLOW DIV-ROT GEAR GD-07BB00G0 | 39 | 1 |
| 37. | 73540004 | MOTOR ASM W/ CB 103-3085-012 | | 2 |
| 38. | 91727611 | KIT-HRDW TH20K BODY ASM MOTOR ROT | | 1 |
| 39. | 91727621 | HYD KIT-TH20K MOTOR ROTATION | | 1 |
| 40. | 72053000 | NIPPLE-PIPE BLK .12X CLOSE | 38 | 2 |
| 41. | 72531098 | ELBOW-STL .12 X 90 DEG | 38 | 2 |
| 42. | 60146494 | COVER-TH20K ROT. GEAR - MOTOR SIDE | | 2 |
| 43. | 60146495 | COVER-TH20K ROT. GEAR - PINION SIDE | | 2 |
| REV. C CN | | TO THE STATE OF TH | | |

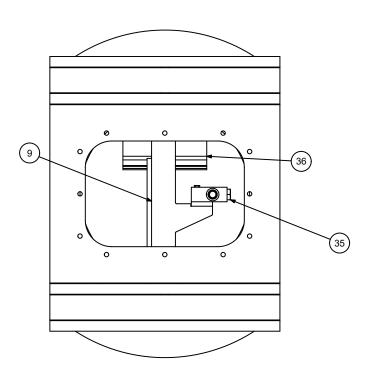
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| 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. | 52727608 52727609 53000713 60010844 60105964 60106032 60145886 52727913 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | WLDMT-MOTOR COVER TH20K BODY-WLDMT TH20K MOTOR ROT GREASE EXT-38.00 OAL 36.00HOSE GREASE PLATE-DRIVE GEAR SUPPORT PLT-PINION STUD50-13X1.75 COVER PLATE- BODY TH20K WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z CAP SCR .31-18X 1.00 HH GR5 Z | 39 38 38 38 39 | 2 1 1 2 2 4 1 2 1 1 2 2 2 4 |
|--|--|--|----------------------------|--|
| 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. | 53000713 60010844 60105964 60106032 60145886 52727913 60145888 70055409 71056073 71056264 72053508 72060008 720600025 72060046 | GREASE EXT-38.00 OAL 36.00HOSE GREASE PLATE-DRIVE GEAR SUPPORT PLT-PINION STUD50-13X1.75 COVER PLATE- BODY TH20K WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 38 | 1 2 2 4 1 2 1 1 2 2 2 2 |
| 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. | 60010844 60105964 60106032 60145886 52727913 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | GREASE PLATE-DRIVE GEAR SUPPORT PLT-PINION STUD50-13X1.75 COVER PLATE- BODY TH20K WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 38 | 2 2 4 1 2 1 1 2 2 2 2 |
| 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. | 60105964 60106032 60145886 52727913 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | SUPPORT PLT-PINION STUD50-13X1.75 COVER PLATE- BODY TH20K WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 38 | 2 4 1 2 1 1 2 2 2 2 |
| 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. | 60106032 60145886 52727913 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | STUD50-13X1.75 COVER PLATE- BODY TH20K WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 38 | 4 1 2 1 1 2 2 2 |
| 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. | 60145886 52727913 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | COVER PLATE- BODY TH20K WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 38 | 1 2 1 1 2 2 2 |
| 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. | 52727913 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | 2 1 1 2 2 2 |
| 9. 10. 11. 12. 13. 14. 15. 16. 17. | 60145888 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | BRACKET-BULKHEAD MOUNT TH20K GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | 1 1 2 2 2 |
| 10. 11. 12. 13. 14. 15. 16. 17. | 70055409 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | GEAR-TURNTABLE BEARING TH20K GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | 1 2 2 2 |
| 11. 12. 13. 14. 15. 16. | 71056073 71056264 72053508 72053561 72060008 72060025 72060046 | GEAR-PINION 301-10052-1 GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | 2 2 2 |
| 12. 13. 14. 15. 16. | 71056264 72053508 72053561 72060008 72060025 72060046 | GEAR-INTMD 301-10103-1 ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | 2 |
| 13. 14. 15. 16. 17. | 72053508 72053561 72060008 72060025 72060046 | ZERK-NPT .12 ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | 2 |
| 14. 15. 16. 17. | 72053561 72060008 72060025 72060046 | ZERK-NPT .12X90 DEG CAP SCR .25-20X 2.00 HH GR5 Z | 38 | |
| 14. 15. 16. 17. | 72060008 72060025 72060046 | CAP SCR .25-20X 2.00 HH GR5 Z | | |
| 15. 16. 17. | 72060008 72060025 72060046 | | | |
| 16. 17. | 72060046 | CAP SCR .31-18X 1.00 HH GR5 Z | | 2 |
| 17. | 72060046 | | 38 | 4 |
| 10 | 70000000 | CAP SCR .38-16X 1.00 HH GR5 Z | 38, 39 | 16 |
| 18. I | 72060092 | CAP SCR .50-13X 1.25 HH GR5 Z | 38 | 12 |
| 19. | 72060101 | CAP SCR .50-13X 5.00 HH GR5 Z | 38 | 24 |
| 20. | 72060117 | CAP SCR .50-13X 1.50 HH GR8 Z | 38 | 4 |
| 21. | 72062080 | NUT .50-13 HEX NYLOCK | 38 | 4 |
| 22. | 72062104 | NUT .25-20 HEX NYLOCK | 39 | 2 |
| 23. | 72063002 | WASHER .31 FLAT | 38 | 4 |
| 24. | 72063003 | WASHER .38 FLAT | 38, 39 | 16 |
| 25. | 72063039 | MACHY BUSHING 2.00X10 GA NR | 38 | 2 |
| 26. | 72063050 | WASHER .31 LOCK | 38 | 4 |
| 27. | 72063051 | WASHER .38 LOCK | 38, 39 | 16 |
| 28. | 72063053 | WASHER .50 LOCK | 38 | 40 |
| 29. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 38 | 23 |
| 30. | 72063117 | WASHER .56 FLAT ASTM F436 | 38 | 8 |
| | 72066095 | RETAINING RING-EXT 2.00 STD | 38 | 2 |
| 32. | 72531130 | ELBOW-STREET STL .12 X 90 DEG | 38 | 1 |
| 33. | 72601144 | CAP SCR .56-12X 2.00 HH GR8 Z | 38 | 8 |
| 34. | 72602089 | CAP SCR .62-11X 4.75 HH GR8 Z | 38 | 23 |
| 35. | 73054614 | FLOW DIV-COMB-FD50-45-8DD-N-66 | 39 | 1 |
| 36. | 73054829 | FLOW DIV-ROT GEAR GD-07BB00G0 | 39 | 1 |
| 37. | 73540004 | MOTOR ASM W/ CB 103-3085-012 | | 2 |
| 38. | 91727611 | KIT-HRDW TH20K BODY ASM MOTOR ROT | | 1 |
| 39. | 91727621 | HYD KIT-TH20K MOTOR ROTATION | | 1 |
| 40. | 72053000 | NIPPLE-PIPE BLK .12X CLOSE | 38 | 2 |
| 41. | 72531098 | ELBOW-STL .12 X 90 DEG | 38 | 2 |
| 42. | 60146494 | COVER-TH20K ROT. GEAR - MOTOR SIDE | | 2 |
| 43. | 60146495 | COVER-TH20K ROT. GEAR - PINION SIDE | | 2 |
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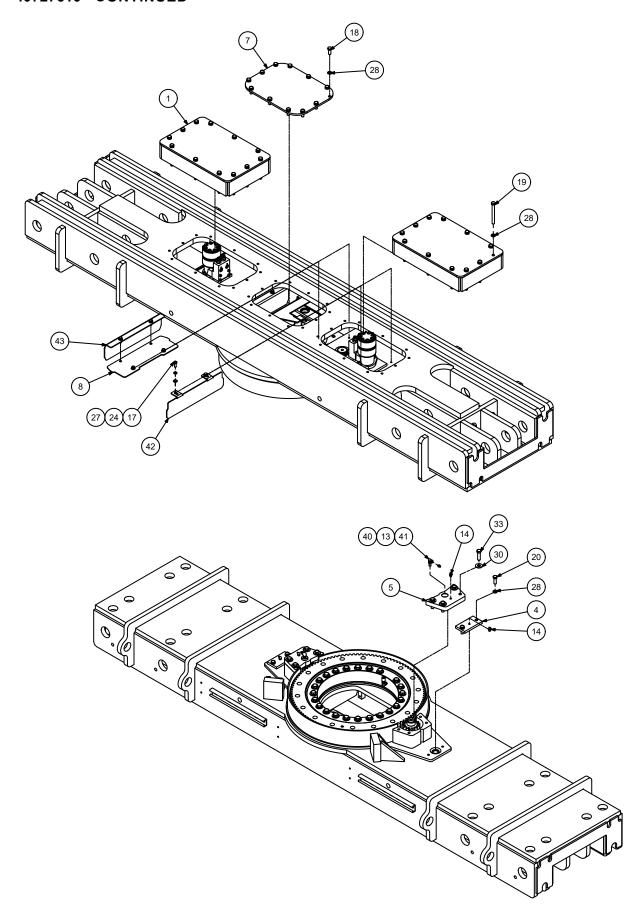




40727610-2 PARTS LIST

| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|-----------|----------|---|---------|------|
| 1. | 52727608 | WLDMT-MOTOR COVER TH20K | | 2 |
| 2. | 52727609 | BODY-WLDMT TH20K MOTOR ROT | | 1 |
| 3. | 53000713 | GREASE EXT-38.00 OAL 36.00HOSE | | 1 |
| 4. | 60010844 | GREASE PLATE-DRIVE GEAR | | 2 |
| 5. | 60105964 | SUPPORT PLT-PINION | | 2 |
| 6. | 60106032 | STUD50-13X1.75 | 39 | 4 |
| 7. | 60145886 | COVER PLATE- BODY TH20K | | 1 |
| 8. | 52727913 | WLDMT-COVER-TH20K ROT. GEAR - PINION SIDE | | 2 |
| 9. | 60145888 | BRACKET-BULKHEAD MOUNT TH20K | | 1 |
| 10. | 70055409 | GEAR-TURNTABLE BEARING TH20K | | 1 |
| 11. | 71056073 | GEAR-PINION 301-10052-1 | | 2 |
| 12. | 71056264 | GEAR-INTMD 301-10103-1 | | 2 |
| 13. | 72053508 | ZERK-NPT .12 | 38 | 2 |
| 14. | 72053561 | ZERK-NPT .12X90 DEG | 38 | 4 |
| 15. | 72060008 | CAP SCR .25-20X 2.00 HH GR5 Z | 39 | 2 |
| 16. | 72060025 | CAP SCR .31-18X 1.00 HH GR5 Z | 38 | 4 |
| 17. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 38, 39 | 16 |
| 18. | 72060092 | CAP SCR .50-13X 1.25 HH GR5 Z | 38 | 12 |
| 19. | 72060101 | CAP SCR .50-13X 5.00 HH GR5 Z | 38 | 24 |
| 20. | 72060117 | CAP SCR .50-13X 1.50 HH GR8 Z | 38 | 4 |
| 21. | 72062080 | NUT .50-13 HEX NYLOCK | 38 | 4 |
| 22. | 72062104 | NUT .25-20 HEX NYLOCK | 39 | 2 |
| 23. | 72063002 | WASHER .31 FLAT | 38 | 4 |
| 24. | 72063003 | WASHER .38 FLAT | 38, 39 | 16 |
| 25. | 72063039 | MACHY BUSHING 2.00X10 GA NR | 38 | 2 |
| 26. | 72063050 | WASHER .31 LOCK | 38 | 4 |
| 27. | 72063051 | WASHER .38 LOCK | 38, 39 | 16 |
| 28. | 72063053 | WASHER .50 LOCK | 38 | 40 |
| 29. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 38 | 23 |
| 30. | 72063117 | WASHER .56 FLAT ASTM F436 | 38 | 8 |
| 31. | 72066095 | RETAINING RING-EXT 2.00 STD | 38 | 2 |
| 32. | 72531130 | ELBOW-STREET STL .12 X 90 DEG | 38 | 1 |
| 33. | 72601144 | CAP SCR .56-12X 2.00 HH GR8 Z | 38 | 8 |
| 34. | 72602089 | CAP SCR .62-11X 4.75 HH GR8 Z | 38 | 23 |
| 35. | 73054614 | FLOW DIV-COMB-FD50-45-8DD-N-66 | 39 | 1 |
| 36. | 73054829 | FLOW DIV-ROT GEAR GD-07BB00G0 | 39 | 1 |
| 37. | 73540004 | MOTOR ASM W/ CB 103-3085-012 | | 2 |
| 38. | 91727611 | KIT-HRDW TH20K BODY ASM MOTOR ROT | | 1 |
| 39. | 91727621 | HYD KIT-TH20K MOTOR ROTATION | | 1 |
| 40. | 72053000 | NIPPLE-PIPE BLK .12X CLOSE | 38 | 2 |
| 41. | 72531098 | ELBOW-STL .12 X 90 DEG | 38 | 2 |
| 42. | 60146494 | COVER-TH20K ROT. GEAR - MOTOR SIDE | | 2 |
| 43. | 60146495 | COVER-TH20K ROT. GEAR - PINION SIDE | | 2 |
| REV. C CN | 1076 | | | |

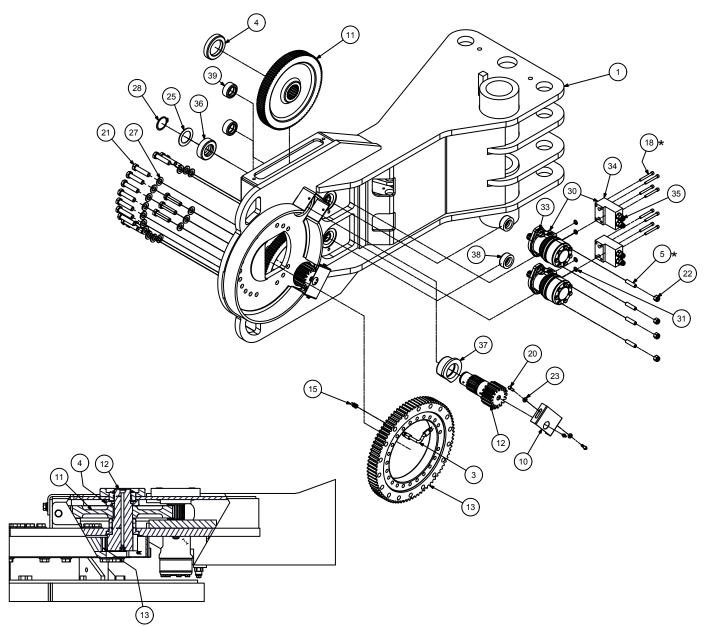
40727610 - CONTINUED



TH20K167 - Manual # 99905542

| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY |
|----------|----------|-----------------------------------|---------|-----|
| 1. | 52727608 | WLDMT-MOTOR COVER TH20K | | 2 |
| 2. | 52727609 | BODY-WLDMT TH20K MOTOR ROT | | 1 |
| 3. | 53000713 | GREASE EXT-38.00 OAL 36.00HOSE | | 1 |
| 4. | 60010844 | GREASE PLATE-DRIVE GEAR | | 2 |
| 5. | 60020123 | THRUST WASH-BRZ 2.50X4.00X .31 | | 2 |
| 6. | 60105964 | SUPPORT PLT-PINION | | 2 |
| 7. | 60106032 | STUD50-13X1.75 | 39 | 4 |
| 8. | 60145886 | COVER PLATE- BODY TH20K | | 1 |
| 9. | 60145887 | COVER-TH20K ROTATION GEAR | | 4 |
| 10. | 60145888 | BRACKET-BULKHEAD MOUNT TH20K | | 1 |
| 11. | 70055409 | GEAR-TURNTABLE BEARING TH20K | | 1 |
| 12. | 71056073 | GEAR-PINION 301-10052-1 | | 2 |
| 13. | 71056264 | GEAR-INTMD 301-10103-1 | | 2 |
| 14. | 72053508 | ZERK-NPT .12 | 39 | 4 |
| 15. | 72053561 | ZERK-NPT .12X90 DEG | 39 | 2 |
| 16. | 72060008 | CAP SCR .25-20X 2.00 HH GR5 Z | 40 | 2 |
| 17. | 72060025 | CAP SCR .31-18X 1.00 HH GR5 Z | 39 | 4 |
| 18. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 39, 40 | 12 |
| 19. | 72060092 | CAP SCR .50-13X 1.25 HH GR5 Z | 39 | 12 |
| 20. | 72060101 | CAP SCR .50-13X 5.00 HH GR5 Z | 39 | 24 |
| 21. | 72060117 | CAP SCR .50-13X 1.50 HH GR8 Z | 39 | 4 |
| 22. | 72062080 | NUT .50-13 HEX NYLOCK | 39 | 4 |
| 23. | 72062104 | NUT .25-20 HEX NYLOCK | 40 | 2 |
| 24. | 72063002 | WASHER .31 FLAT | 39 | 4 |
| 25. | 72063003 | WASHER .38 FLAT | 39, 40 | 12 |
| 26. | 72063039 | MACHY BUSHING 2.00X10 GA NR | | 2 |
| 27. | 72063050 | WASHER .31 LOCK | 39 | 4 |
| 28. | 72063051 | WASHER .38 LOCK | 39, 40 | 12 |
| 29. | 72063053 | WASHER .50 LOCK | 39 | 40 |
| 30. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 39 | 23 |
| 31. | 72063117 | WASHER .56 FLAT ASTM F436 | 39 | 8 |
| 32. | 72066095 | RETAINING RING-EXT 2.00 STD | 39 | 2 |
| 33. | 72531130 | ELBOW-STREET STL .12 X 90 DEG | 39 | 1 |
| 34. | 72601144 | CAP SCR .56-12X 2.00 HH GR8 Z | 39 | 8 |
| 35. | 72602089 | CAP SCR .62-11X 4.75 HH GR8 Z | 39 | 23 |
| 36. | 73054614 | FLOW DIV-COMB-FD50-45-8DD-N-66 | 40 | 1 |
| 37. | 73054829 | FLOW DIV-ROT GEAR GD-07BB00G0 | 40 | 1 |
| 38. | 73540004 | MOTOR ASM W/ CB 103-3085-012 | | 2 |
| 39. | 91727611 | KIT-HRDW TH20K BODY ASM MOTOR ROT | | 1 |
| 40. | 91727621 | HYD KIT-TH20K MOTOR ROTATION | | 1 |
| REV. C | | | I . | |

TH20K167 - Hand Assembly (40726415)

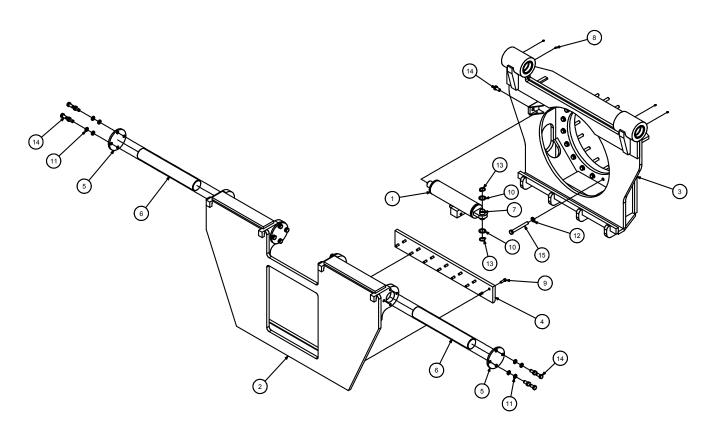


DETAIL: GEAR TRAIN

- 1. Use.Loctite 277 on all 5 / 8" bolts.
- 2. Torque all 5 / 8" bolts to 280 ft-lb.

| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|----------|----------|---------------------------------|---------|------|
| 1. | 52724549 | HAND WLDMT-TH20K | - | 1 |
| 2. | 52724550 | CLAW-WLDMT TH20K | - | 1 |
| 3. | 53000700 | GREASE EXT- 8.00 OAL 6.00HOSE | - | 1 |
| 4. | 60030468 | SPACER- INTERMEDIATE GEAR | - | 2 |
| 5. | 60106032 | STUD50-13X1.75 | 32 | 4 |
| 6. | 60139294 | GEAR GUARD-20K TH TIP | - | 1 |
| 7. | 60139295 | COVER- TH INTERMEDIATE GEAR | - | 2 |
| 8. | 60139308 | PLATE-GREASE | - | 2 |
| 9. | 60139309 | COVER-ACCESS HOLE CLAW | - | 1 |
| 10. | 60140334 | COVER-PINION GEAR | - | 2 |
| 11. | 71056264 | GEAR-INTMD 301-10103-1 | - | 2 |
| 12. | 71056265 | GEAR-PINION 301-10104-1 | - | 2 |
| 13. | 71056389 | GEAR-TRNTBL BRG 449-05190-1 | - | 1 |
| 14. | 72053508 | ZERK-NPT .12 | 32 | 5 |
| 15. | 72053638 | ADPTR-MPT/FPT SWVL .12 .12 | - | 1 |
| 16. | 72060091 | CAP SCR .50-13X 1.00 HH GR5 Z | 32 | 4 |
| 17. | 72060092 | CAP SCR .50-13X 1.25 HH GR5 Z | 32 | 7 |
| 18. | 72060738 | CAP SCR .31-18 2.50 SH PLAIN | 32 | 8 |
| 19. | 72060793 | CAP SCR .50-13X 1.00 SH ZINC | 32 | 4 |
| 20. | 72060833 | SCR-THRD.CUT .31-18X.75 HWH-1 | 32 | 4 |
| 21. | 72060931 | CAP SCR .62-11X 2.75 HH GR8 Z | 32 | 16 |
| 22. | 72062080 | NUT .50-13 HEX NYLOCK | 32 | 4 |
| 23. | 72063002 | WASHER .31 FLAT | 32 | 4 |
| 24. | 72063005 | WASHER .50 FLAT | 32 | 3 |
| 25. | 72063038 | MACHY BUSHING 2.00X14 GA NR | 32 | 2 |
| 26. | 72063053 | WASHER .50 LOCK | 32 | 15 |
| 27. | 72063119 | WASHER .62 FLAT ASTM F436 | 32 | 28 |
| 28. | 72066095 | RETAINING RING-EXT 2.00 STD | 32 | 2 |
| 29. | 72601482 | CAP SCR .62-11X 2.50 HH GR8 Z | 32 | 12 |
| 30. | 73511285 | MOTOR ASM W/ CB VALVE | - | 2 |
| 31. | 7Q072112 | O RING .50X .69X .09 70 | 32 | 4 |
| 32. | 91726416 | KIT-HRDW TH20K HAND ASM | - | 1 |
| 33. | 73511286 | MOTOR-HYD 151-2477 | 30 | 2 |
| 34. | 73540008 | VALVE BLK-DBL 15 GPM .44-20SAE | 30 | 2 |
| 35. | 73051941 | VALVE-CBAL 02-371063 (CBCH-LJN) | 30 | 4 |
| 36. | 60020181 | BUSHING-B148 ROTATION | 1 | 2 |
| 37. | 60020182 | BUSHING-B148 ROTATION | 1 | 2 |
| 38. | 60020246 | BUSHING-BRZ 1.50X 2.25X 0.94 | 1 | 2 |
| 39. | 60020247 | BUSHING-BRZ 1.50X 2.25X 1.00 | 1 | 2 |
| REV. D | | | | |

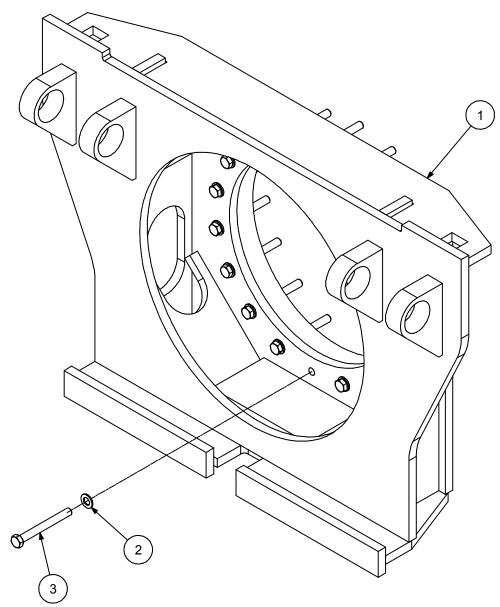
TH20K167 - Sub Base Assembly (40727628)



HARDWARE IS CONTAINED IN KIT NO. 91727632

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | | |
|--------------|----------------------------|-------------------------------|------|--|--|
| 1. | 51726426 | CYL-4.0/2.0 12.00S 23.00CC | 1 | | |
| 2. | 52724902 | BASE WELDMENT-SIDE SHIFTER | 1 | | |
| 3. | 52727630 | SUB BASE WLDMT-TH10K-20K | 1 | | |
| 4. | 60030253 | WEAR PAD-SIDE SHIFTER TH2557B | 1 | | |
| 5. | 60117735 | CAP-SIDE SHIFTER PIN TH2557B | 4 | | |
| 6. | 60117737 | PIN-TYPE F 3.50X23.94 | 2 | | |
| 7. | 60118798 | PIN-TYPE A 1.50X 2.94 (2.44) | 1 | | |
| 8. | 72053507 | ZERK-STR THD .25-28 | 4 | | |
| 9. | 72060795 | CAP SCR .50-13X 1.50 SH PLAIN | 14 | | |
| 10. | 72063037 | MACHY BUSHING 1.50X10 GA NR | 2 | | |
| 11. | 72063056 | WASHER .75 LOCK | 16 | | |
| 12. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 18 | | |
| 13. | 72066132 | RETAINING RING-EXT 1.50 HD | 2 | | |
| 14. | 72601485 | CAP SCR .75-10X 1.50 HH GR8 Z | 17 | | |
| 15. | 72602157 | CAP SCR .75-10X 6.75 HH GR8 Z | 18 | | |
| REV. INITIAL | REV. INITIAL RELEASE CN883 | | | | |

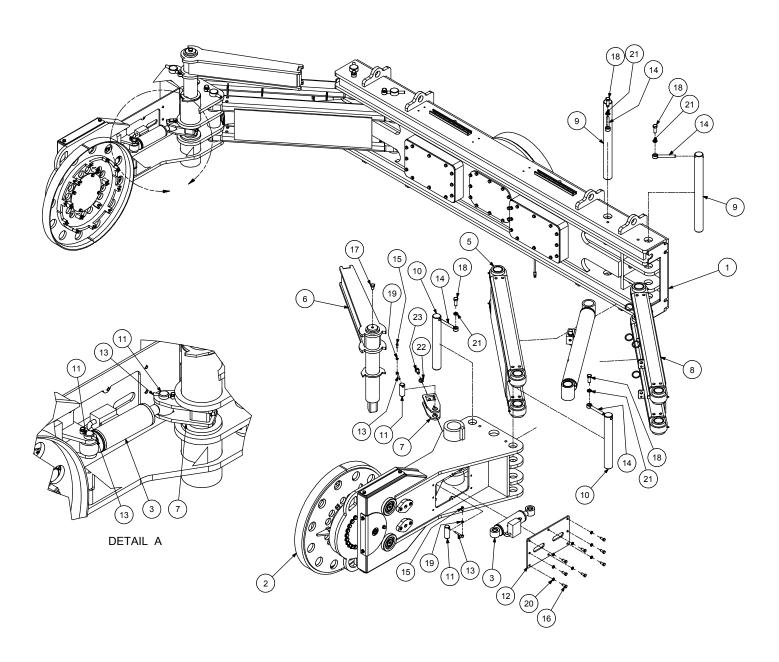
TH20K167 - Sub Base Asm w/o Side Shift (40727629)



HARDWARE IS CONTAINED IN KIT NO. 91727636

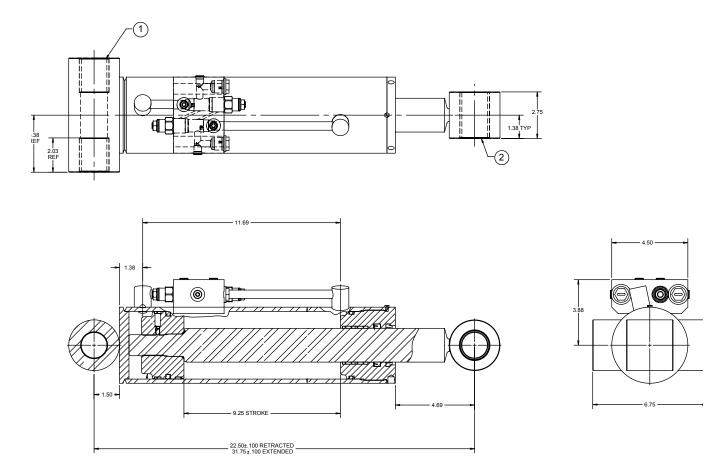
| ITEM NO. | PART NO. | DESCRIPTION | QTY. | | |
|--------------|----------------------------|--|------|--|--|
| 1. | 52727631 | SUB BASE WLDMT-TH10K-20K WO SIDE SHIFT | 1 | | |
| 2. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 18 | | |
| 3. | 72602157 | CAP SCR .75-10X 6.75 HH GR8 Z | 18 | | |
| REV. INITIAL | REV. INITIAL RELEASE CN883 | | | | |

TH20K167 - Clamp Assembly (40726418)



| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|-----------|----------|--------------------------------|---------|------|
| 1. | 40727610 | BODY ASM-TH20K MOTOR ROT | - | 1 |
| 2. | 40726415 | HAND ASM-TH20K | - | 2 |
| 3. | 51726428 | CYL-3.0/1.5 5.00S 13.75 CC C | - | 2 |
| 4. | 51726419 | CYL-4.0/2.5 19.25S 42.00CC C | - | 2 |
| 5. | 52711931 | ARM WLDMT TIREHAND 2557B | - | 2 |
| 6. | 52724551 | FLAG-WLDMT TH20K W-FALLBACK | - | 2 |
| 7. | 52724552 | WLDMT-PIVOT, FALLBACK ARM | - | 2 |
| 8. | 52724762 | ARM WLDMT TIREHAND 2557B | - | 2 |
| 9. | 60139296 | PIN-TYPE H 2.50X27.75 | - | 4 |
| 10. | 60139297 | PIN-TYPE H 2.50X19.00 | - | 4 |
| 11. | 60139298 | PIN-TYPE H 1.50 X 4.00 | - | 4 |
| 12. | 60139307 | COVER- FALL BACK CYL | - | 2 |
| 13. | 71415014 | KEEPER-PIN .38 | - | 4 |
| 14. | 71415017 | KEEPER-PIN .75 | - | 8 |
| 15. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 24 | 4 |
| 16. | 72060092 | CAP SCR .50-13X 1.25 HH GR5 Z | 24 | 16 |
| 17. | 72060181 | CAP SCR .75-10X 1.00 HH GR5 Z | 24 | 2 |
| 18. | 72060206 | CAP SCR .75-10X 2.00 HH GR8 Z | 24 | 8 |
| 19. | 72063051 | WASHER .38 LOCK | 24 | 4 |
| 20. | 72063053 | WASHER .50 LOCK | 24 | 16 |
| 21. | 72063056 | WASHER .75 LOCK | 24 | 8 |
| 22. | 72063116 | WASHER .75 N FLAT H ASTMF436Z | 24 | 2 |
| 23. | 72601989 | CAP SCR .75-10X 1.25 HH GR8 Z | 24 | 2 |
| 24. | 91726420 | KIT-HRDW TH10K-TH20K CLAMP ASM | - | 1 |
| REV. B CN | 857 | | | , |

TH20K167 - Cylinder (51724677)



USE SEAL KIT NUMBER: 71415915

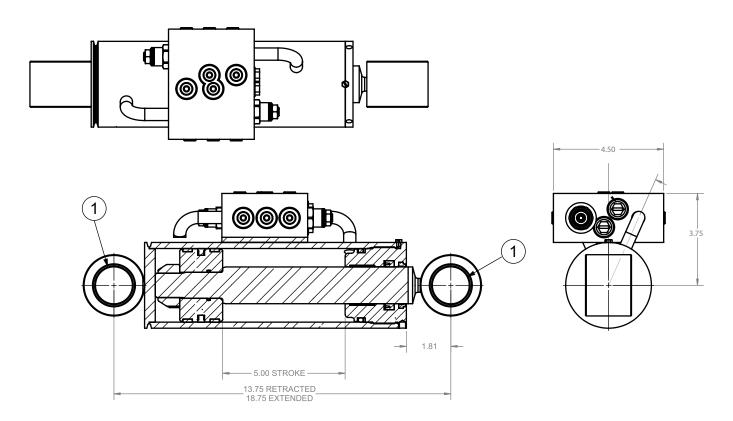
| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|----------|----------|----------------|------|
| 1. | 70055370 | BEARING - CASE | 2 |
| 2. | 70055402 | BEARING - ROD | 1 |
| REV. B | | | |

NOTES:

- Apply never-seez regular grade anti-seez and lubricating compound to threads on the cylinder head only, keep away from all seals.
- Apply lubriplate no. 630-2 Medium heavy, multi-purpose lubricant, to all piston, head gland, and holding valve seals, nylon lock ring, cast iron piston rings, and rod stinger threads.

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TH20K167 - Cylinder (51726428)

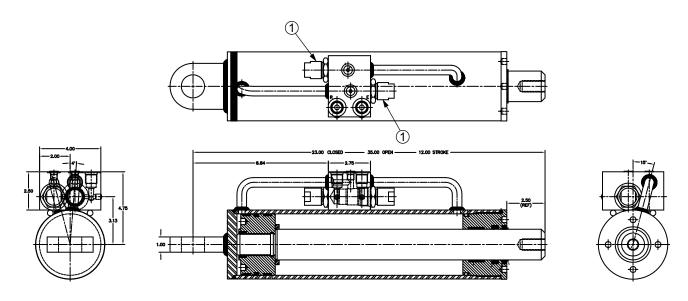


USE SEAL KIT NUMBER: 94399967

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | |
|----------------------|----------|-------------|------|--|
| 1. | 73540621 | VALVE-CBAL | 2 | |
| REV. INITIAL RELEASE | | | | |

- Apply never-seez regular grade anti-seez and lubricating compound to threads on the cylinder head only, keep away from all seals.
- Apply lubriplate no. 630-2 Medium heavy, multi-purpose lubricant, to all piston, head gland, and holding valve seals, nylon lock ring, cast iron piston rings, and rod stinger threads.

TH20K167 - Cylinder (51726426)

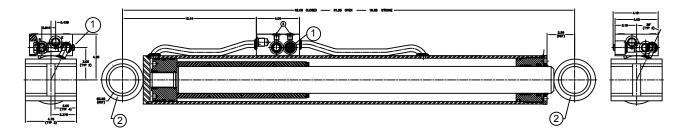


USE SEAL KIT NUMBER: 9B015930

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | | | |
|----------------------|----------|-------------|------|--|--|--|
| 1. | 73054242 | VALVE-CBAL | 2 | | | |
| REV. INITIAL RELEASE | | | | | | |

- Apply never-seez regular grade anti-seez and lubricating compound to threads on the cylinder head only, keep away from all seals.
- Apply lubriplate no. 630-2 Medium heavy, multi-purpose lubricant, to all piston, head gland, and holding valve seals, nylon lock ring, cast iron piston rings, and rod stinger threads.

TH20K167 - Cylinder (51726419)

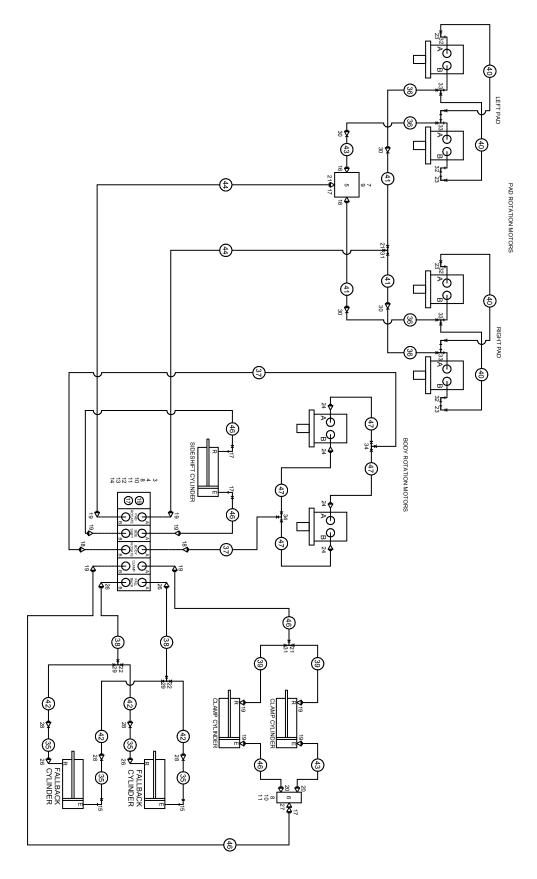


USE SEAL KIT NUMBER: 9C160920

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | |
|----------------------|----------|-------------|------|--|
| 1. | 73540622 | VALVE-CBAL | 1 | |
| 2. | 70034283 | BEARING | 4 | |
| REV. INITIAL RELEASE | | | | |

- Apply never-seez regular grade anti-seez and lubricating compound to threads on the cylinder head only, keep away from all seals.
- Apply lubriplate no. 630-2 Medium heavy, multi-purpose lubricant, to all piston, head gland, and holding valve seals, nylon lock ring, cast iron piston rings, and rod stinger threads.

TH20K167 - HYD Kit, Motor Rotation with Valve Bank (91727621)



| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|----------|----------|--|---------|------|
| 1. | 91727623 | HOSE KIT-20K VALVE BANK MOTOR ROT | - | 1 |
| 2. | 91727653 | HRDW KIT-TH20K W/VALVE BANK | - | 1 |
| 3. | 73540631 | VALVE BANK-5-SECT PSL2 TH20K MTRBR 24VDC | - | 1 |
| 4. | 60140348 | MTG BRKT-VALVE BANK TH5K - TH20K | - | 1 |
| 5. | 73054614 | FLOW DIV-COMB-FD50-45-8DD-N-66 | - | 1 |
| 6. | 73054829 | FLOW DIV-ROT GEAR GD-07BB00G0 | - | 1 |
| 7. | 72060008 | CAP SCR .25-20X 2.00 HH GR5 Z | 2 | 2 |
| 8. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 2 | 8 |
| 9. | 72062104 | NUT .25-20 HEX GR5 Z NYLOCK | 2 | 2 |
| 10. | 72063003 | WASHER-FLAT .38 W ANSI B27.2 Z | 2 | 8 |
| 11. | 72063051 | WASHER-LOCK .38 ZINC | 2 | 8 |
| 12. | 72601278 | CAP SCR M 8-1.25X 20 HHZ | 2 | 3 |
| 13. | 72601797 | WASHER-LOCK M 8 | 2 | 3 |
| 14. | 72601799 | WASHER-FLAT M 8 N | 2 | 3 |
| 15. | 72053758 | ELBOW-M STR/90/M JIC 4 4 | 1 | 2 |
| 16. | 72053762 | ELBOW-M STR/90/M JIC 6 8 | 1 | 2 |
| 17. | 72053763 | ELBOW-M STR/90/M JIC 8 8 | 1 | 5 |
| 18. | 72532356 | ADPTR-M STR/M JIC 8 6 | 1 | 2 |
| 19. | 72532358 | ADPTR-M STR/M JIC 8 8 | 1 | 11 |
| 20. | 72532360 | ADPTR-M STR/M JIC 12 8 | 1 | 2 |
| 21. | 72532658 | ELBOW-M JIC/90/F JIC SW 8 8 | 1 | 3 |
| 22. | 72532690 | ELBOW-M JIC/90/F JIC SW 4 4 | 1 | 2 |
| 23. | 72532772 | ELBOW-M JIC/90/F JIC SW 6 6 | 1 | 4 |
| 24. | 72532775 | ADPTR-M STR/M JIC 4 6 | 1 | 4 |
| 25. | 72532779 | ELBOW-M STR/90/M JIC XLG 6 8 | 1 | 1 |
| 26. | 72532792 | ADPTR-M STR/M JIC 8 4 | 1 | 4 |
| 27. | 72532963 | ADPTR-M STR/F STR 16 8 | 1 | 1 |
| 28. | 72533024 | UNION-BULKHEAD JIC 4 (7/16-20) | 1 | 4 |
| 29. | 72533050 | TEE-BULKHEAD RUN .44 JIC | 1 | 2 |
| 30. | 72533373 | UNION-BULKHEAD JIC 8 (3/4-16) | 1 | 4 |
| 31. | 72533591 | TEE-BULKHEAD RUN .75 (8) | 1 | 2 |
| 32. | 72533594 | ELBOW-M STR/90/M JIC 4 6 | 1 | 4 |
| 33. | 72534858 | TEE-STL STR/JIC/JIC 4 6 6 RUN | 1 | 4 |
| 34. | 72534927 | UNION-BULKHEAD BRANCH TEE JIC 6 | 1 | 2 |
| 35. | 51393976 | HOSE-FF .25 X 42.00 (4-4) 100R2 | 1 | 4 |
| 36. | 51394617 | HOSE-FF .38 X 63.00 (6-8) 100R2 | 1 | 4 |
| 37. | 51395417 | HOSE-FF .38 X 9.00 (6-6) 100R17 | 1 | 2 |
| 38. | 51395574 | HOSE-FJ .25 X 28.50 (4-4) 100R2 | 1 | 2 |
| 39. | 51395736 | HOSE-FF .50 X 74.00 (8-8) 100R17 | 1 | 2 |
| 40. | 51395887 | HOSE-FJ .38 X 17.50 (6-6) 100R17 | 1 | 4 |
| 41. | 51396278 | HOSE-FF .50 X 96.00 (8-8) 100R17 | 1 | 3 |
| 42. | 51396821 | HOSE-FF .25 X 96.00 (4-4) 100R2 | 1 | 4 |
| 43. | 51396964 | HOSE-FJ .50 X 96.00 (8-8) 100R17 | 1 | 2 |
| 44. | 51397082 | HOSE-FJ .50 X 31.00 (8-8) 100R17 | 1 | 2 |
| 45 | 51399713 | HOSE-FF .50 X 52.00 (8-8) 100R17 | 1 | 1 |

| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|----------------------------|----------|--|---------|------|
| 46. | 51399714 | HOSE-FJ .50 X 50.00 (8-8) 100R17 | 1 | 4 |
| 47. | 51490073 | HOSE-FF .38 X 30.00 (6-6) 100R17 | 1 | 4 |
| 48. | 70733889 | CABLE ASM-33ft BATT & RADIO ELIMINATION | - | 1 |
| 49. | 70734590 | TRANSM-RAD REM TH3565 5K-36K | - | 1 |
| 50. | 70734591 | RECEIVER-RAD REM TH3565 5K-36K | - | 1 |
| 51. | 77441524 | HARNESS-TIREHAND RADIO REMOTE TH5k-TH36k | - | 1 |
| 52. | 77441525 | HARNESS-TIREHAND CHASS INTERFACE TH5k-36 | - | 1 |
| REV. INITIAL RELEASE CN883 | | | | |

NOTE:

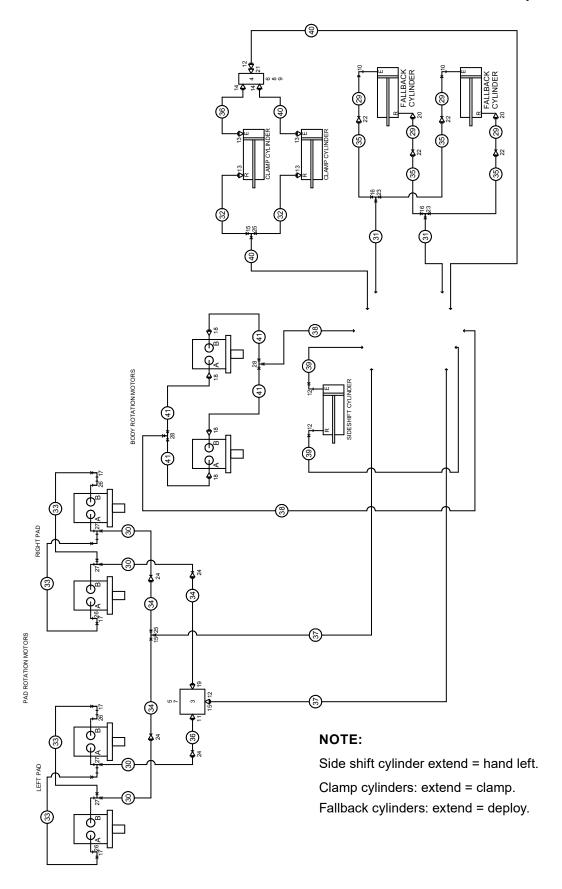
1. Side shift cylinder extend = hand left.

2. Clamp cylinders: extend = clamp.

3. Fallback cylinders: extend = deploy.

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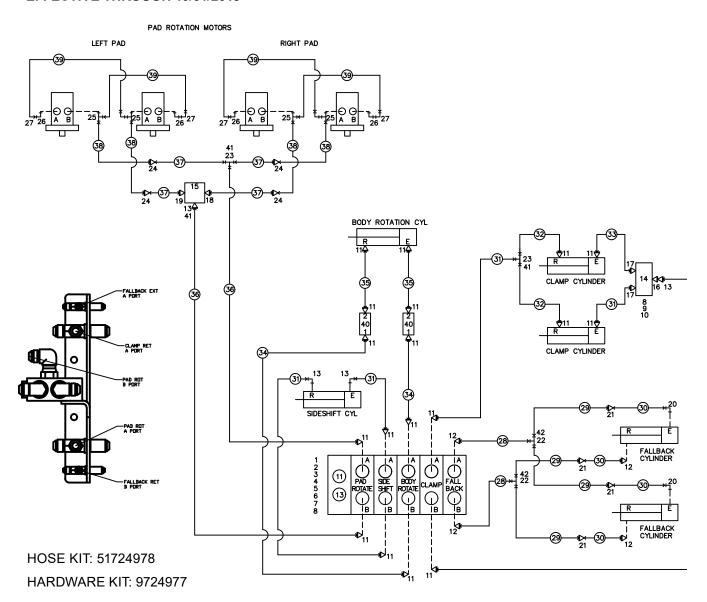
TH20K167 - HYD Kit, Motor Rotation w/o Valve Bank (91727650)



| ITEM NO. | PART NO. | DESCRIPTION | KIT NO. | QTY. |
|----------|----------|---------------------------------------|---------|------|
| 1. | 91727657 | HOSE KIT-20K W/O VALVE BANK MOTOR ROT | - | 1 |
| 2. | 91727655 | HRDW KIT-TH20K W/O VALVE BANK | - | 1 |
| 3. | 73054614 | FLOW DIV-COMB-FD50-45-8DD-N-66 | - | 1 |
| 4. | 73054915 | FLOW DIV-ROT GEAR GD-07BB00GV | - | 1 |
| 5. | 72060008 | CAP SCR .25-20X 2.00 HH GR5 Z | 2 | 2 |
| 6. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 2 | 4 |
| 7. | 72062104 | NUT .25-20 HEX GR5 Z NYLOCK | 2 | 2 |
| 8. | 72063003 | WASHER-FLAT .38 W ANSI B27.2 Z | 2 | 4 |
| 9. | 72063051 | WASHER-LOCK .38 ZINC | 2 | 4 |
| 10. | 72053758 | ELBOW-M STR/90/M JIC 4 4 | 1 | 2 |
| 11. | 72053762 | ELBOW-M STR/90/M JIC 6 8 | 1 | 1 |
| 12. | 72053763 | ELBOW-M STR/90/M JIC 8 8 | 1 | 4 |
| 13. | 72532358 | ADPTR-M STR/M JIC 8 8 | 1 | 4 |
| 14. | 72532360 | ADPTR-M STR/M JIC 12 8 | 1 | 2 |
| 15. | 72532658 | ELBOW-M JIC/90/F JIC SW 8 8 | 1 | 3 |
| 16. | 72532690 | ELBOW-M JIC/90/F JIC SW 4 4 | 1 | 2 |
| 17. | 72532772 | ELBOW-M JIC/90/F JIC SW 6 6 | 1 | 4 |
| 18. | 72532775 | ADPTR-M STR/M JIC 4 6 | 1 | 4 |
| 19. | 72532779 | ELBOW-M STR/90/M JIC XLG 6 8 | 1 | 1 |
| 20. | 72532792 | ADPTR-M STR/M JIC 8 4 | 1 | 2 |
| 21. | 72532963 | ADPTR-M STR/F STR 16 8 | 1 | 1 |
| 22. | 72533024 | UNION-BULKHEAD JIC 4 (7/16-20) | 1 | 4 |
| 23. | 72533050 | TEE-BULKHEAD RUN .44 JIC | 1 | 2 |
| 24. | 72533373 | UNION-BULKHEAD JIC 8 (3/4-16) | 1 | 4 |
| 25. | 72533591 | TEE-BULKHEAD RUN .75 (8) | 1 | 2 |
| 26. | 72533594 | ELBOW-M STR/90/M JIC 4 6 | 1 | 4 |
| 27. | 72534858 | TEE-STL STR/JIC/JIC 4 6 6 RUN | 1 | 4 |
| 28. | 72534927 | UNION-BULKHEAD BRANCH TEE JIC 6 | 1 | 2 |
| 29. | 51393976 | HOSE-FF .25 X 42.00 (4-4) 100R2 | 1 | 4 |
| 30. | 51394617 | HOSE-FF .38 X 63.00 (6-8) 100R2 | 1 | 4 |
| 31. | 51395574 | HOSE-FJ .25 X 28.50 (4-4) 100R2 | 1 | 2 |
| 32. | 51395736 | HOSE-FF .50 X 74.00 (8-8) 100R17 | 1 | 2 |
| 33. | 51395887 | HOSE-FJ .38 X 17.50 (6-6) 100R17 | 1 | 4 |
| 34. | 51396278 | HOSE-FF .50 X 96.00 (8-8) 100R17 | 1 | 3 |
| 35. | 51396821 | HOSE-FF .25 X 96.00 (4-4) 100R2 | 1 | 4 |
| 36. | 51396964 | HOSE-FJ .50 X 96.00 (8-8) 100R17 | 1 | 2 |
| 37. | 51397082 | HOSE-FJ .50 X 31.00 (8-8) 100R17 | 1 | 2 |
| 38. | 51395417 | HOSE-FF .38 X 9.00 (6-6) 100R17 | 1 | 2 |
| 39. | 51399713 | HOSE-FF .50 X 52.00 (8-8) 100R17 | 1 | 1 |
| 40. | 51399714 | HOSE-FJ .50 X 50.00 (8-8) 100R17 | 1 | 4 |
| 41. | 51490073 | HOSE-FF .38 X 30.00 (6-6) 100R17 | 1 | 4 |

TH20K167 - Hydraulic Kit W/Valve Bank (91724907)

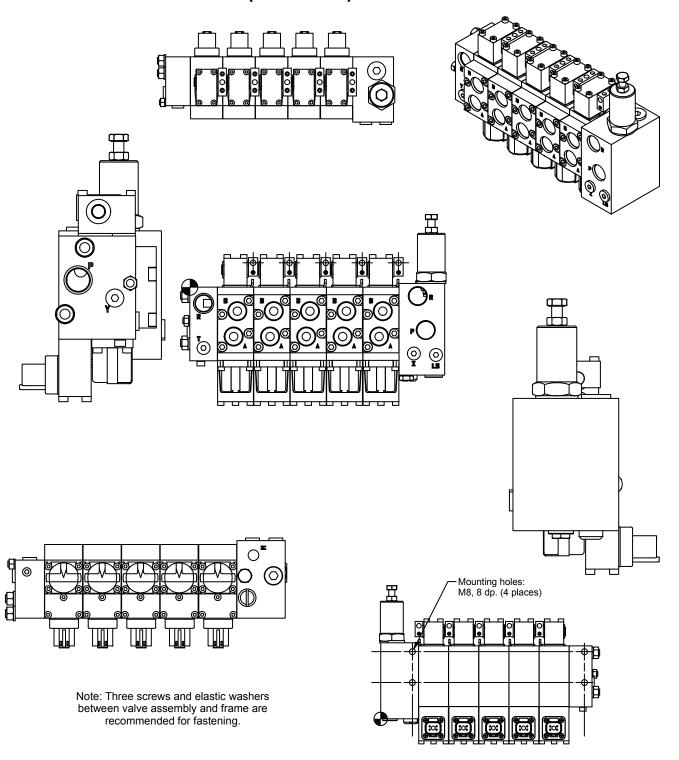
EFFECTIVE THROUGH 10/31/2018



- Side shift cylinder extend equals hand left.
- Body rotation cylinder extend equals hand clockwise.
- Clamp cylinders extend equals clamp.
- · Fallback cylinders extend equals deploy.

| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|-------------|--------------|---------------------------------------|------|
| 1. | 73540533 | VALVE BANK | 1 |
| 2. | 60140348 | MOUNTING BRACKET - VALVE BANK | 1 |
| 3 | 72601278 | CAP SCR .38 - 16X 1.25 HH GR5 Z | 3 |
| 4 | 72601797 | LOCK WASHER 8 MM | 3 |
| 5. | 72601799 | WASHER 8MM | 3 |
| 6. | 72060047 | CAP SCR .38 X 16X 1.25 HH GR5 Z | 4 |
| 7. | 720063051 | WASHER - LOCK .38 ZINC | 4 |
| 8. | 72063003 | WASHER -FLAT .38 W ANSI B27.2 Z | 12 |
| 9. | 72060052 | CAP SCR .38 - 16X 2.00 HH GR5 Z | 4 |
| 10. | 72062103 | NUT .38 - 16 HEX GR5 Z NYLOCK | 4 |
| 11. | 72532358 | ADAPTER, #8 MALE STR / #8 MALE JIC | 19 |
| 12. | 72532792 | ADPTR -M STR / M JIC 8 4 | 4 |
| 13. | 72053763 | ELBOW, #8 MALE JIC / 90°/ #8 M STR | 5 |
| 14. | 73054829 | FLOW DIVIDER | 1 |
| 15. | 73054614 | FLOW DIVIDER | 1 |
| 16. | 72532963 | ADAPTER, #16 MALE STR / #8 FEMALE STR | 1 |
| 17. | 72532360 | ADAPTER, #12 MALE STR / #8 MALE JIC | 2 |
| 18. | 72532779 | ELBOW - M STR / 90 / M JIC XLG 6 8 | 1 |
| 19. | 72053762 | ELBOW - M STR / 90 / M JIC 6 8 | 1 |
| 20. | 72053758 | ELBOW, M STR / M JIC #4 | 2 |
| 21. | 72533024 | UNION -BULKHEAD JIC 4 (7 / 16 - 20) | 4 |
| 22. | 72533050 | TEE - BULKHEAD RUN .44 JIC | 2 |
| 23. | 72533591 | TEE -BULKHEAD RUN .75 (8) | 2 |
| 24. | 72533373 | UNION - BULKHEAD JIC 8 (3/4-16) | 4 |
| 25. | 72534858 | TEE-STL STR / JIC / JIC 4 6 6 RUN | 4 |
| 26. | 72533594 | ELBOW-M STR/90/M JIC 4 6 | 4 |
| 27. | 72532772 | ELBOW - M JIC / 90 / F JIC SW 6 6 | 4 |
| 28. | 51395574 | HOSE - FJ .25 X 28.50 (4-4) | 2 |
| 29. | 51396821 | HOSE - FF .25 X 96.00 (4-4) 100R2 | 2 |
| 30. | 51393976 | HOSE – FF .25 X 42.00 (4-4) | 4 |
| 31. | 51399714 | HOSE – FJ .50 X 50.00 (8-8) | 5 |
| 32. | 51395736 | HOSE – FF .50 X 70.00 (8-8) 100R17 | 2 |
| 33. | 51396964 | HOSE - FJ .50 X 96.00 (8-8) 100R17 | 2 |
| 34. | 51396828 | HOSE – FJ .50 X 27.00 (8-8) | 2 |
| 35. | 51392461 | HOSE – FF .50 X 25.00 (8-8) 100R2 | 2 |
| 36. | 51397082 | HOSE – FJ .50 X 31.00 (8-8) | 2 |
| 37. | 51396278 | HOSE - FF .50 X 96.00 (8-8) 100R17 | 4 |
| 38. | 51394617 | HOSE - FF .38 X 63.00 (6-8) 100R2 | 4 |
| 39. | 51395887 | HOSE -FJ .38 X 17.50 (6-6) | 4 |
| 40. | 72534886 | VALVE FLOW CONTROL | 2 |
| 41. | 72532658 | ELBOW - M JIC / 90 / F JIC SW 8 8 | 3 |
| 42. | 72532690 | ELBOW -M JIC / 90 / F JIC SW 4 4 | 2 |
| REV. B EFFI | ECTIVE THROU | GH 10/31/2018 | |

TH20K167 - Valve Bank (73540631)



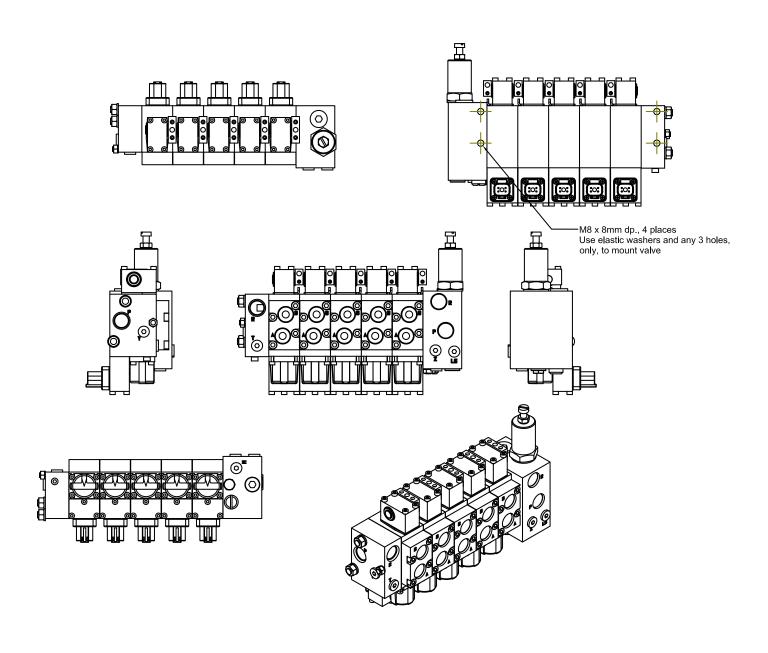
| CONNECTION PORTS |
|----------------------|
| P, P1, R, R1 = SAE-8 |
| LS, M, Z = SAE-4 |
| , B = SAE-8 |
| T, Y = SAE-4 |

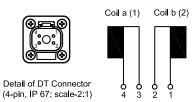
TYPE CODE

- PSL UNF 2H1/D200-2
- A5 H40/40 /EA1 /UNF 2
- A5 O40/40 /EA1 /UNF 2
- A5 O25/25 /EA1 /UNF 2
- A5 O40/40 /EA1 /UNF 2
- A2 O25/25 /EA1 /UNF 2
- E 19 UNF-DT 24

TH20K167 - Valve Bank (73540533)

EFFECTIVE THROUGH 10/31/2018



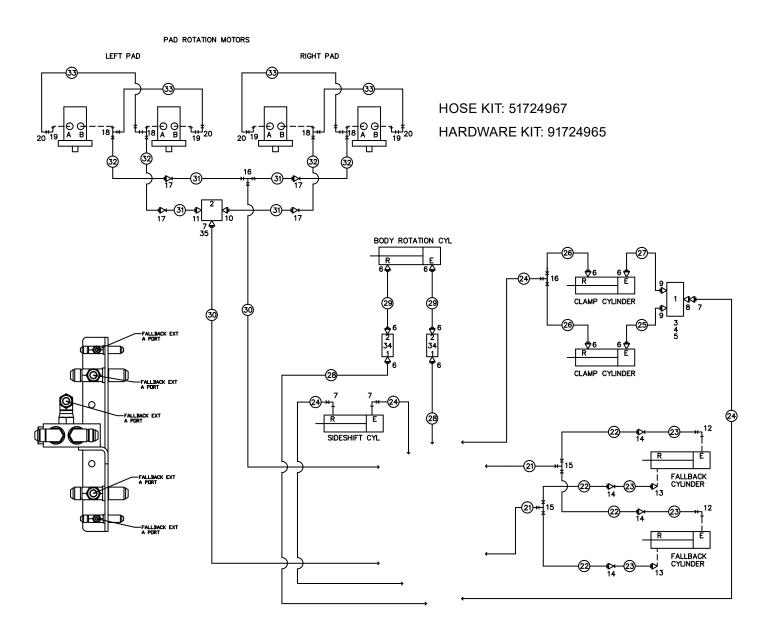


Porting
A, B, P, R = SAE -8
LS, M, T, Y, Z = SAE -4

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TH20K167 - Hydraulic Kit w/o Valve Bank (91724923)

EFFECTIVE THROUGH 10/31/2018



NOTES:

- Side shift cylinder extend equals hand left.
- Body rotation cylinder extend equals hand clockwise.
- · Clamp cylinders extend equals clamp.
- · Fallback cylinders extend equals deploy.

91724923 PARTS LIST

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | | |
|-------------------------------------|----------|---------------------------------------|------|--|--|
| 1. | 73054915 | FLOW DIVIDER | 1 | | |
| 2. | 73054614 | FLOW DIVIDER | 1 | | |
| 3. | 72063003 | WASHER-FLAT .38 W ANSI B27.2 Z | 8 | | |
| 4. | 72060050 | CAP SCR .38-16X 2.00 HH GR5 Z | 4 | | |
| 5. | 72062103 | NUT .38-16 HEX GR5 Z NYLOCK | 4 | | |
| 6. | 72532358 | ADAPTER, #8 MALE STIR/#8 MALE JIC | 10 | | |
| 7. | 72053763 | ELBOW, #8 MALE JIC/90"/#8 M STIR | 4 | | |
| 8. | 72532963 | ADAPTER, #16 MALE STIR/#8 FEMALE STIR | 1 | | |
| 9. | 72532360 | ADAPTER, #12 MALE STIR/#8 MALE JIC | 2 | | |
| 10. | 72532779 | ELBOW-M STIR/90/M JIC XLG 6 8 | 1 | | |
| 11. | 72053762 | ELBOW-M STIR/90/M JIC 6 8 | 1 | | |
| 12. | 72053758 | ELBOW, M STIR/M JIC #4 | 2 | | |
| 13. | 72532792 | ADAPTER, M STIR/M JIC 8 4 | 2 | | |
| 14. | 72533024 | UNION-BULKHEAD JIC 4 (7 /16-20) | 4 | | |
| 15. | 72533050 | TEE-BULKHEAD RUN .44 JIC | 2 | | |
| 16. | 72533591 | TEE-BULKHEAD RUN .75 (8) | 2 | | |
| 17. | 72533373 | UNION-BULKHEAD JIC 8 (3/4-16) | 4 | | |
| 18. | 72534858 | TEE-STL STIR/JIC/JIC 4 6 6 RUN | 4 | | |
| 19. | 72533594 | ELBOW-M STIR/90/M JIC 4 6 | 4 | | |
| 20. | 72532772 | ELBOW-M JIC/90/F JIC SW 6 6 | 4 | | |
| 21. | | HOSE25 X xx (4-4) | 2 | | |
| 22. | 51396821 | HOSE-FF .25 X 96.00 (4-4) 100R2 | 4 | | |
| 23. | 51393976 | HOSE-FF .25 X 42.00 (4-4) | 4 | | |
| 24. | | HOSE50 X xx (8-8) | 4 | | |
| 25. | 51399714 | HOSE-FJ .50 X 50.00 (8-8) | 1 | | |
| 26. | 51395736 | HOSE-FF .50 X 74.00 (8-8) 100R17 | 2 | | |
| 27. | 51396964 | HOSE-FJ .50 X 96.00 (8-8) 100R17 | 1 | | |
| 28. | | HOSE50 X xx (8-8) | 2 | | |
| 29. | 51392461 | HOSE-FF .50 X 25.00 (8-8) 100R2 | 2 | | |
| 30. | | HOSE50 X xx (8-8) | 2 | | |
| 31. | 51396278 | HOSE-FF .50 X 96.00 (8-8) 100R17 | 4 | | |
| 32. | 51394617 | HOSE-FF .38 X 63.00 (6-8) 100R2 | 4 | | |
| 33. | 51395887 | HOSE-FJ .38 X 17.50 (6-6) | 4 | | |
| 34. | 72534886 | VALVE-FLOW CONTROL | 2 | | |
| 35. | 72532658 | ELBOW-M JIC/90/F JIC SW 8 8 | 1 | | |
| REV. B EFFECTIVE THROUGH 10/31/2018 | | | | | |

NOTE: Items shown are common service items, for part numbers not assigned contact:

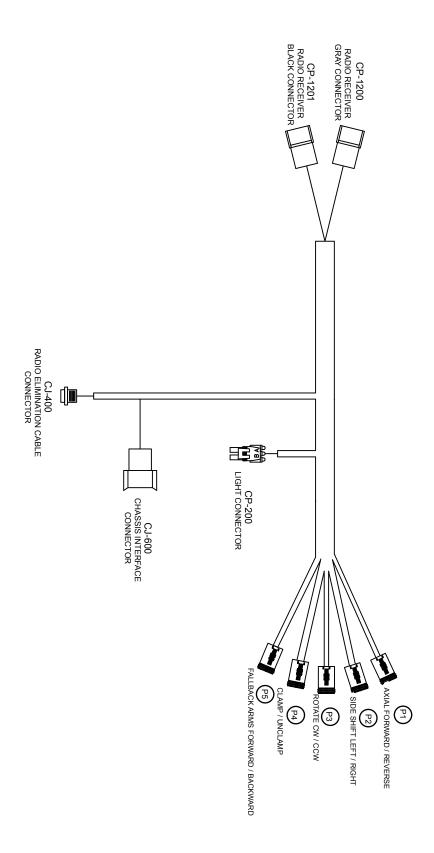
IOWA MOLD TOOLING CO., INC. TECHNICAL SUPPORT TEAM TELEPHONE: 800-554-4421

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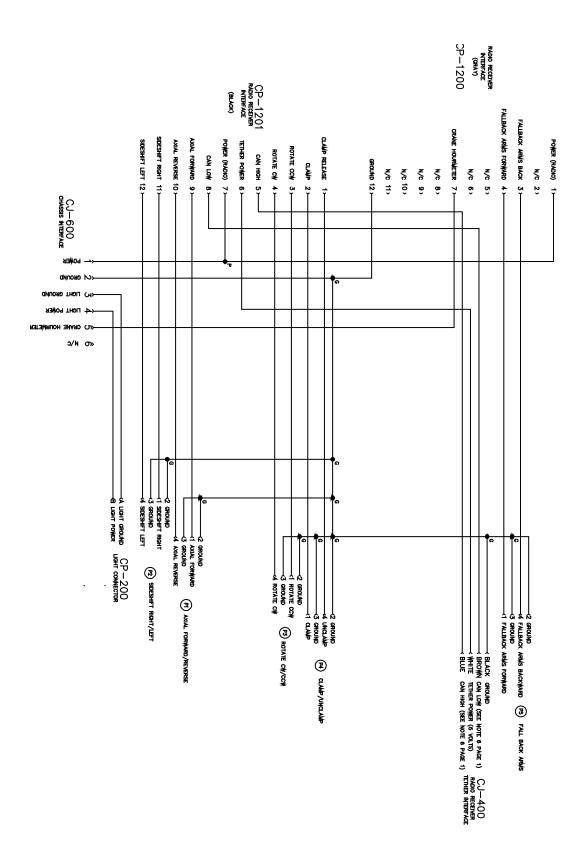
Section - 6

Electrical & Lighting

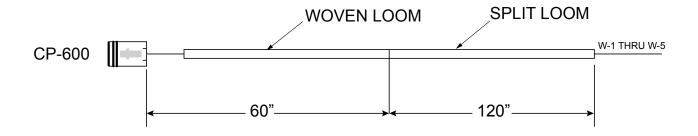
TH20K167 - Radio Remote Harness (77441524)



77441524-1



TH20K167 - Chassis Interface Harness (77441525)



77441525-1 RADIO REMOTE HARNESS

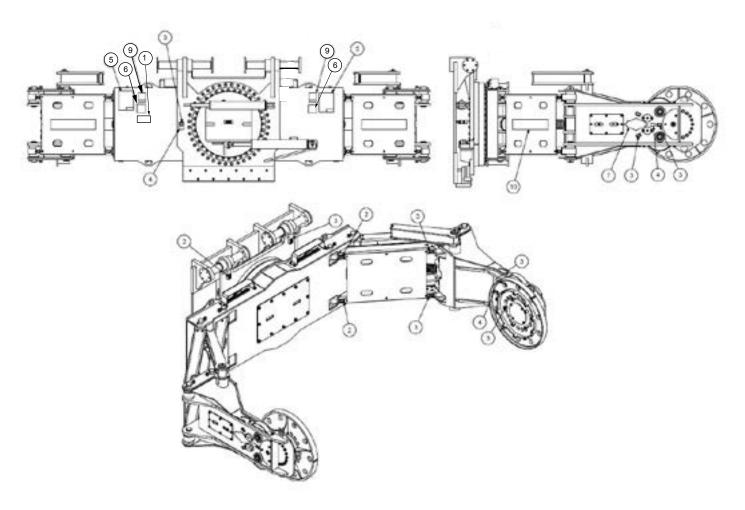
| | CP-600 TIREHAND CONNECTOR | |
|-------------------|---------------------------|--------------------|
| POWER 1———— | | W1 POWER |
| GROUND 2 | | W2 GROUND |
| LIGHT GROUND 3 | | W3 LIGHT GROUND |
| LIGHT POWER 4 | | W4 LIGHT POWER |
| CRANE HOURMETER 5 | | W5 CRANE HOURMETER |
| N/C6 | | |

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Section - 7

General Information

TH20K167 - Decal Kit (95724918)



NOTE: This drawing denotes the location of the decals only. It does not identify the individual models. The appearance of the Tirehand may be different than shown.

95724918 PARTS LIST

| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|----------|----------|---|------|
| 1. | 70029119 | PLACARD-SERIAL NUMBER | 1 |
| 2. | 70391612 | DECAL-GREASE WEEKLY (LEFT) | 14 |
| 3. | 70391613 | DECAL-GREASE WEEKLY (RIGHT) | 15 |
| 4. | 70392524 | DECAL-ROTATE CRANE WHILE GREASE | 5 |
| 5. | 70393671 | DECAL-TH OPERATION WARNINGS | 2 |
| 6. | 70393672 | DECAL-DANGER TH OPERATION | 2 |
| 7. | 70398903 | DECAL-DIAMOND IMT 5.00X10.00-REFLECTIVE | 2 |
| 8. | 72661638 | TACK-METAL | 2 |
| 9. | 70399418 | DECAL KIT-TH20K | 2 |
| 10. | 70399417 | DECAL-IDENT TH20K167 | 2 |
| REV. A | | | |

TH20K167 - Troubleshooting

| SYMPTOM | PROBABLE CAUSE |
|---|---|
| | E-stop on remote pressed in. |
| | Remote not turned on. |
| | Pump not engaged - if supplied with electric clutch |
| O and the late of | Hydraulic oil supply is low. |
| Controls fail to respond | Hydraulic pressure line is ruptured. |
| | Suction line shut-off valve is obstructed. |
| | Faulty hydraulic pump. |
| | Incorrectly set relief valve. |
| | Hydraulic oil supply is low. |
| | Hydraulic pump is operating at a reduced speed. |
| | Relief valve is set too low. |
| | Pump or cylinder is worn. |
| Operation slows down. | Pump is slipping due to excessive oil temperature. (This is a factor which will increase with worn components.) |
| | Dirty filter. |
| | Inoperative valve spools. |
| | Obstructed cylinder holding valve. |
| Rotation control slowed or erratic. | Internal port orifices are clogged. |
| Rotation control slowed of effatic. | Rotation gears are locked or damaged. |
| Arms and pads drift when loaded and | Hydraulic oil is bypassing at piston rings. |
| controls neutralized. | Cylinder holding valves are defective or contaminated. |
| | Pump captivation due to low hydraulic oil supply. |
| | Loading is excessive. |
| | Restriction or collapse of suction line. |
| Unusual noise in operation. | Bypass settings on relief valve are too low. |
| | Relief valve is damaged. |
| | Valve closure is obstructed due to particle accumulation. |
| | Bearings need lubrication. |
| Side step chatters or slows. | Mechanical damage to bracket |
| | Lower cylinder damaged. |
| Arm chatter or noise. | Arms need both internal and external lubrication. |
| ATTI CHARLET OF HOISE. | Bearing damaged. |

General Information 81 Section - 7

TH20K167 - Cylinders

The Tirehand uses similar cylinders in all functions. Common disassembly and repair instructions apply. Check the Parts section for specific information.

To remove the clamp cylinder:

- Rotate the Tirehand until the clamp cylinder is in a horizontal position.
- 2. Extend the cylinder full stroke.
- Shut off the carrier vehicle's engine. Relieve internal hydraulic pressure by cycling the controls.
- 4. Remove the cover from the body (refer to the appropriate body drawing) and disconnect the hydraulic hoses at the cylinder port block. Cap the hydraulic hoses.
- 5. Support the hand assembly with a lifting device and straps capable of supporting the assembly. Take up slack in the lifting device
- 6. Disconnect and cap any hydraulic lines leading to the pad rotation mechanism.
- 7. Remove the cylinder rod pin by removing the 3/4-10 cap screws and washer securing the pin. Drive out t he pin.
- 8. Support the hand assembly. Remove the two smaller hand/arm pins by removing the 3/4-10 cap screws securing the pins. Drive out the pins.
- 9. Lift the hand assembly away and place on a clean surface. Keep dirt out of the bushing surfaces.
- 10. Support the clamp cylinder with a lifting device and straps capable of supporting the cylinder.
- 11. Remove the cylinder base pin securing screw and washer. Drive the pin only far enough to release the cylinder.
- 12. Lift the cylinder away and repair as necessary.

To install the clamp cylinder:

- 1. Position the cylinder in the slings of the lifting device and line up the base end pin boss and pin. Seat the pin and secure using the 3/4-10 cap screw and washer. Torque to 265 ft-lb (36.6 kg-m).
- 2. Lift the hand assembly with the slings and position the pin bosses in line with the pins. Drive in the pins and secure using the 3/4-10 hardware. Torque to 265 ft-lb (36.6 kg-m).
- 3. Connect the hydraulic hoses to the clamp cylinder and axial rotation motor.
- 4. Start the engine. Cycle the CLAMP and PAD controls through at least five cycles to purge any air trapped in the system. Check for leaks
- 5. Check the hydraulic fluid level with all cylinders retracted. Fill if necessary.
- 6. Test the unit with a simulated job operation before proceeding to the job site..

SIDE SHIFT CYLINDER REMOVAL AND INSTALLATION

To remove the side shift cylinder:

- 1. Rotate the Tirehand so that the side shift cylinder is in a horizontal position.
- 2. Disconnect the hydraulic hoses from the cylinder port. Cap the hoses.
- 3. Remove the retaining rings and bushings from the rod end and base end of the cylinder. Drive out the pins.
- 4. Disassemble and repair the cylinder.

To install the cylinder:

- 1. Line up the cylinder base-end pin boss with the holes in the base. Drive in the pin and install the machinery bushing and retaining ring.
- 2. Connect the hydraulic hoses to the cylinder port.
- 3. Extend and retract the cylinder until the rod-end pin boss lines up with the holes in the sub- base. Drive in the pin and install the machinery bushing and retaining ring.
- 4. Extend and retract the cylinder through five (5) complete cycles to purge air that may be trapped in the system. Check for leaks.
- 5. Check the hydraulic reservoir fluid level with all cylinders retracted. Fill if necessary.
- 6. Conduct a simulated job operation before proceeding to the job site.

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TH20K167 - Replacement Parts

COUNTER BALANCE VALVES

Counterbalance valves are considered non-repairable and must be replace if defective.

HYDRAULIC PUMP

The installer or manufacturer of the carrier vehicle must supply 12 gpm (45.4 Lpm) of hydraulic fluid at 3000 psi (207 bar).

TH20K167 - Hydraulic Motors

Six hydraulic motors are used on the Tirehand: two for Tirehand rotation and two each side for pad rotation. These motors are not considered field repairable and should be replaced if defective.

HYDRAULIC MOTOR REMOVAL AND REPLACEMENT

To remove rotation motor:

- 1. Disconnect and cap the hydraulic hoses.
- 2. Remove the two motor mounting bolts.
- 3. Remove the counterbalance block and hose fittings from the old motor.

To install the new motor:

- 1. Install the counterbalance block and hose fittings from the old motor. Do not use the old o-rings, they should be replaced.
- 2. Position the motor on the base and install the two mounting bolts. Torque them to the proper value (See Torque Table).
- Connect the hoses.
- 4. Start the engine, rotate the Tirehand five (5) times in both directions and check for leaks.
- 5. With all cylinders retracted, check the fluid level in the reservoir and fill if necessary.

TH20K167 - Relief Valve Adjustment

The hydraulic system is designed to operate at a pressure requirement of 3000 psi (207 bar) with an optimum oil flow of 12 gpm (45.4 Lpm). To adjust the relief valve:

- 1. Start the vehicle and engage the pump.
- 2. With the vehicle transmission in neutral, operate any function full stroke, and with function lever still engaged at end of stroke, read the pressure on the gauge at the control valve. It should read between 3000 psi (207 bar).
- 3. If the pressure reading is low, shut off the engine and adjust the relief valve. Loosen the nut on the relief valve adjustment screw, then turn the screw to adjust the pressure. Check the pressure, and continue adjustment if needed.

TH20K167 - Bearing

This section includes instructions on the removal and installation of turntable gear-bearings and bushings.

TURNTABLE GEAR-BEARING

To remove the Tirehand rotation gear-bearing:

- 1. Disconnect and cap the hydraulic hoses from the valve bank.
- 2. Support the clamp arms with an overhead lifting device capable of supporting the weight of the unit. Take up the slack in the lifting device.

A WARNING

The lifting device must be fastened to the tirehand in such a manner that will prevent shifting of the load due to slippage.

- 3. Remove the cover, then remove the bolts that secure the body to the gear-bearing. Slowly work the hoses out of the rotation adapter while simultaneously withdrawing the body. Set the body carefully to one side.
- 4. Disconnect the grease fitting extension from the turntable gear bearing.
- 5. Remove the gear-bearing mounting bolts and remove the gear bearing.

To install the gear-bearing:

- 1. Position the gear-bearing and torque the mounting bolts (see Torque Table).
- Install the grease fitting extension.
- 3. Carefully position the body and clamp arms until the holes in the body line up with the holes in the gear-bearing. Install the mounting bolts and torque to the proper value (see Torque Table).
- Connect the hydraulic hoses to the valve bank.
- 5. Start the engine and cycle all of the Tirehand controls at least five (5) times in both directions to purge the air in the system.
- 6. Check the system for leaks and repair any that are found.
- With all cylinders retracted, check the fluid level in the reservoir and fill if necessary.

AXIAL ROTATION GEAR-BEARING

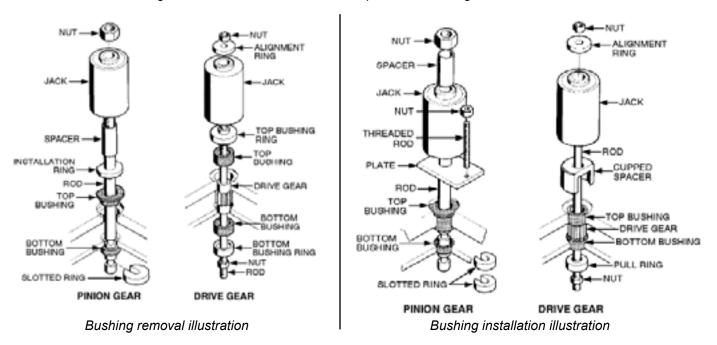
To remove the axial rotation gear-bearing:

- Remove the pad mounting bolts.
- Disconnect the grease fitting extension.
- 3. Remove the gear-bearing mounting bolts and remove the bearing.
- 4. Position the bearing so that the holes align with those in the arm. The grease fitting extension port must be toward the pinion gear. Install and torque the mounting bolts (see Torque Table).
- 5. Install the grease fitting extension.
- Position the pad over the gear-bearing, install and torque the mounting bolts (see Torque Table).

BUSHING REMOVAL AND INSTALLATION

To replace a bushing:

- 1. Remove the weldment containing the bushing.
- 2. Position the bushing removal tool as shown and extract the bushing.
- 3. To install the bushing, assemble the tool as shown and press the bushing in.



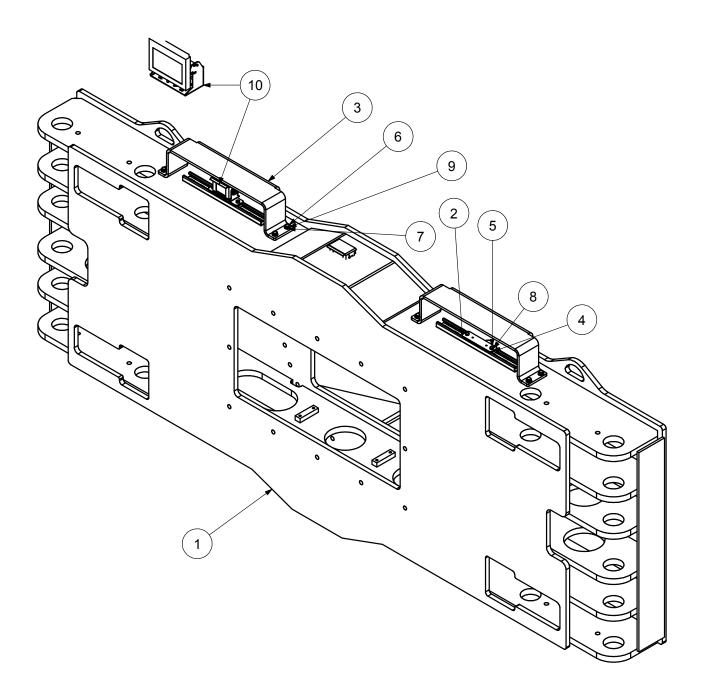
TH20K167 - Turntable Bearing Inspection

Turntable bearings may experience wear. One of the following conditions may indicate turntable bearing wear:

- 1. Metal particles present in the bearing lubricant.
- 2. Increased drive power required to rotate the crane.
- 3. Noise emitting from the bearing during rotation.
- 4. Rough rotation.
- 5. Uneven or excessive wear between the pinion gear and turntable gear.

If one or more of the above conditions exists, further inspection may be required. Contact IMT for assistance.

TH20K167 - Camera Kit Dual (40724922)



40724922 PARTS LIST

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | |
|----------------------|----------|-------------------------------|------|--|
| 1. | | BODY-WLDMT | REF | |
| 2. | 60136590 | CAMERA MOUNT | 2 | |
| 3. | 60139306 | GUARD - CAMERA MNT | 2 | |
| 4. | 71414717 | NUT25-20 CHANNEL | 4 | |
| 5. | 72060004 | CAP SCR .25-20X 1.00 HH GR5 Z | 4 | |
| 6. | 72060046 | CAP SCR .38-16X 1.00 HH GR5 Z | 8 | |
| 7. | 72063003 | WASHER .38 FLAT | 8 | |
| 8. | 72063049 | WASHER .25 LOCK | 4 | |
| 9. | 72063051 | WASHER .38 LOCK | 8 | |
| 10. | 77734564 | CAMERA OPTION-DUAL | 1 | |
| REV. INITIAL RELEASE | | | | |

TH20K167 - Radio Remote

For Radio Remote operation instructions, features, specifications, and programming, see the TireHandler[™] Radio Remote System manual P/N 99905678.

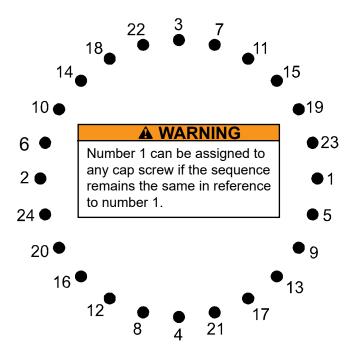


Transmitter P/N 70734590



Receiver P/N 70734591

TH20K167 - Turntable Bearing Thread Tightening Sequence



TIGHTENING PROCEDURE

- Refer to the torque data chart to determine the proper torque value to apply to the size of cap screw used.
- 2. Follow the tightening sequence shown in the diagram. Note the crisscross pattern as shown in the diagram.
- 3. Torque all cap screws to approximately 40% of the specified torque value, by following the sequence.
 - (Example: .40 X 265 ft-lb = 106 ft-lb)
 - (Example-metric: .40 X 36 kg-m = 14.4 Kg-m)
- 4. Repeat step 3, but torquing all cap screws to 75% of the specified torque value. Continue to follow the tightening sequence.
 - (Example: .75 X 265 ft-lb = 199 ft-lb)
 - (Example-metric: $.75 \times 36 \text{ kg-m} = 27 \text{ kg-m}$)
- 5. Using the proper sequence, torque all cap screws to the listed torque value as determined from the torque data chart.

NOTES:

Refer to the turntable bearing thread tightening diagram for proper tightening / torquing sequence of the turntable bearing to the crane base and crane mast. The total quantity of cap screws varies dependent on crane model.

TH20K167 - Thread Torque Chart (English)

| FINE THREAD BOLTS (ENGLISH) | | | | | |
|-----------------------------|--------------|---------------------------|---------|---------------------------|---------|
| SIZE | BOLT DIA. | GRADE 5 SAE J429 GRADE 5 | | GRADE 8 SAE J429 GRADE 8 | |
| (DIA-TPI) | (INCHES) | PLAIN | PLATED | PLAIN | PLATED |
| | | (FT-LB) | (FT-LB) | (FT-LB) | (FT-LB) |
| 5/16-24 | 0.3125 | 19 | 14 | 27 | 20 |
| 3/8-24 | 0.375 | 35 | 26 | 49 | 35 |
| 7/16-20 | 0.4375 | 55 | 41 | 78 | 58 |
| 1/2-20 | 0.5 | 90 | 64 | 120 | 90 |
| 9/16-18 | 0.5625 | 120 | 90 | 170 | 130 |
| 5/8-18 | 0.625 | 170 | 130 | 240 | 180 |
| 3/4-16 | 0.75 | 300 | 225 | 420 | 315 |
| 7/8-11 | 0.875 | 445 | 325 | 670 | 500 |
| 1-12 | 1 | 645 | 485 | 995 | 745 |
| 1 1/8-12 | 1.125 | 890 | 670 | 1445 | 1085 |
| 1 1/4-12 | 1.25 | 1240 | 930 | 2010 | 1510 |
| 1 3/8-12 | 1.375 | 1675 | 1255 | 2710 | 2035 |
| 1 1/2-12 | 1.5 | 2195 | 1645 | 3560 | 2670 |

| COARSE THREAD BOLTS (ENGLISH) | | | | | |
|-------------------------------|--------------|---------------------------|---------|---------------------------|---------|
| SIZE | BOLT DIA. | GRADE 5 SAE J429 GRADE 5 | | GRADE 8 SAE J429 GRADE 8 | |
| (DIA-TPI) | (INCHES) | PLAIN | PLATED | PLAIN | PLATED |
| | | (FT-LB) | (FT-LB) | (FT-LB) | (FT-LB) |
| 5/16-18 | 0.3125 | 17 | 13 | 25 | 18 |
| 3/8-16 | 0.375 | 31 | 23 | 44 | 33 |
| 7/16-14 | 0.4375 | 49 | 37 | 70 | 52 |
| 1/2-13 | 0.5 | 75 | 57 | 105 | 80 |
| 9/16-12 | 0.5625 | 110 | 82 | 155 | 115 |
| 5/8-11 | 0.625 | 150 | 115 | 220 | 160 |
| 3/4-10 | 0.75 | 265 | 200 | 375 | 280 |
| 7/8-9 | 0.875 | 395 | 295 | 605 | 455 |
| 1-8 | 1 | 590 | 445 | 910 | 680 |
| 1 1/8-7 | 1.125 | 795 | 595 | 1290 | 965 |
| 1 1/4-7 | 1.25 | 1120 | 840 | 1815 | 1360 |
| 1 3/8-6 | 1.375 | 1470 | 1100 | 2380 | 1780 |
| 1 1/2-6 | 1.5 | 1950 | 1460 | 3160 | 2370 |

NOTES:

- 1. Tightening torques provided are midrange.
- 2. Consult bolt manufacturer's particular specifications, when provided.
- 3. Use flat washers of equal strength.
- 4. All torque measurements are given in foot-pounds.
- 5. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as never-seez compound graphite and oil, molybdenum disulfide, colloidal copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of loctite does not affect the torque values listed above.

A WARNING

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torqueing. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue causing death or serious injury.

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TH20K167 - Thread Torque Chart (Metric)

| FINE THRE | FINE THREAD TORQUE CHART (METRIC) | | | | | |
|-----------------------|-----------------------------------|---------------------|------------------|---------------------|------------------|--|
| TIGHTEN | IING TORQ | UE | | | | |
| SIZE (DIA- TPI) | BOLT DIA. (INCHES) | SAE J429 GRADE 5 | | SAE J429 GRADE 8 | | |
| | | PLAIN (KG-M) | PLATED (KG-M) | PLAIN (KG- M) | PLATED (KG-M) | |
| 5/16-24 | 0.3125 | 3 | 2 | 4 | 3 | |
| 3/8-24 | 0.375 | 5 | 4 | 7 | 5 | |
| 7/16-20 | 0.4375 | 8 | 6 | 11 | 8 | |
| 1/2-20 | 0.5 | 12 | 9 | 17 | 12 | |
| 9/16-18 | 0.5625 | 17 | 12 | 24 | 18 | |
| 5/8-18 | 0.625 | 24 | 18 | 33 | 25 | |
| 3/4-16 | 0.75 | 41 | 31 | 58 | 44 | |
| 7/8-11 | 0.875 | 62 | 45 | 93 | 69 | |
| 1-12 | 1 | 89 | 67 | 138 | 103 | |
| 1 1/8-12 | 1.125 | 123 | 93 | 200 | 150 | |
| 1 1/4-12 | 1.25 | 171 | 129 | 278 | 209 | |
| 1 3/8-12 | 1.375 | 232 | 174 | 375 | 281 | |
| 1 1/2-12 | 1.5 | 304 | 228 | 492 | 369 | |

| COARSE THREAD TORQUE CHART (METRIC) | | | | | | |
|-------------------------------------|----------------------|---------------------|------------------|---------------------|------------------|--|
| TIGHTEN | TIGHTENING TORQUE | | | | | |
| SIZE (DIA- TPI) | BOLT DIA (INCHES) | SAE J429 GRADE 5 | | SAE J429 GRADE 8 | | |
| | | PLAIN (KG-M) | PLATED (KG-M) | PLAIN (KG-M) | PLATED (KG-M) | |
| 5/16-18 | 0.3125 | 2 | 2 | 3 | 2 | |
| 3/8-16 | 0.375 | 4 | 3 | 6 | 5 | |
| 7/16-14 | 0.4375 | 7 | 5 | 10 | 7 | |
| 1/2-13 | 0.5 | 10 | 8 | 15 | 11 | |
| 9/16-12 | 0.5625 | 15 | 11 | 21 | 16 | |
| 5/8-11 | 0.625 | 21 | 16 | 30 | 22 | |
| 3/4-10 | 0.75 | 37 | 28 | 52 | 39 | |
| 7/8-9 | 0.875 | 55 | 41 | 84 | 63 | |
| 1-8 | 1 | 82 | 62 | 126 | 94 | |
| 1 1/8-7 | 1.125 | 110 | 82 | 178 | 133 | |
| 1 1/4-7 | 1.25 | 155 | 116 | 251 | 188 | |
| 1 3/8-6 | 1.375 | 203 | 152 | 329 | 246 | |
| 1 1/2-6 | 1.5 | 270 | 210 | 438 | 328 | |

NOTES:

- 1. Tightening torques provided are mid-range.
- 2. Consult bolt manufacturer's particular specifications, when provided.
- 3. Use flat washers of equal strength.
- 4. All torque measurements are given in kilogram-meters.
- 5. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as never-seez compound graphite and oil, molybdenum disulfide, colloidal copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of loctite does not affect the torque values listed above.

A WARNING

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Revisions

| DATE | LOCATION | DESCRIPTION |
|-----------|----------|-------------|
| 8/16/2018 | 40726418 | CN857 |
| 9/12/18 | 40727628 | CN864 |
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| | 40727610 | |
| | 40727628 | |



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