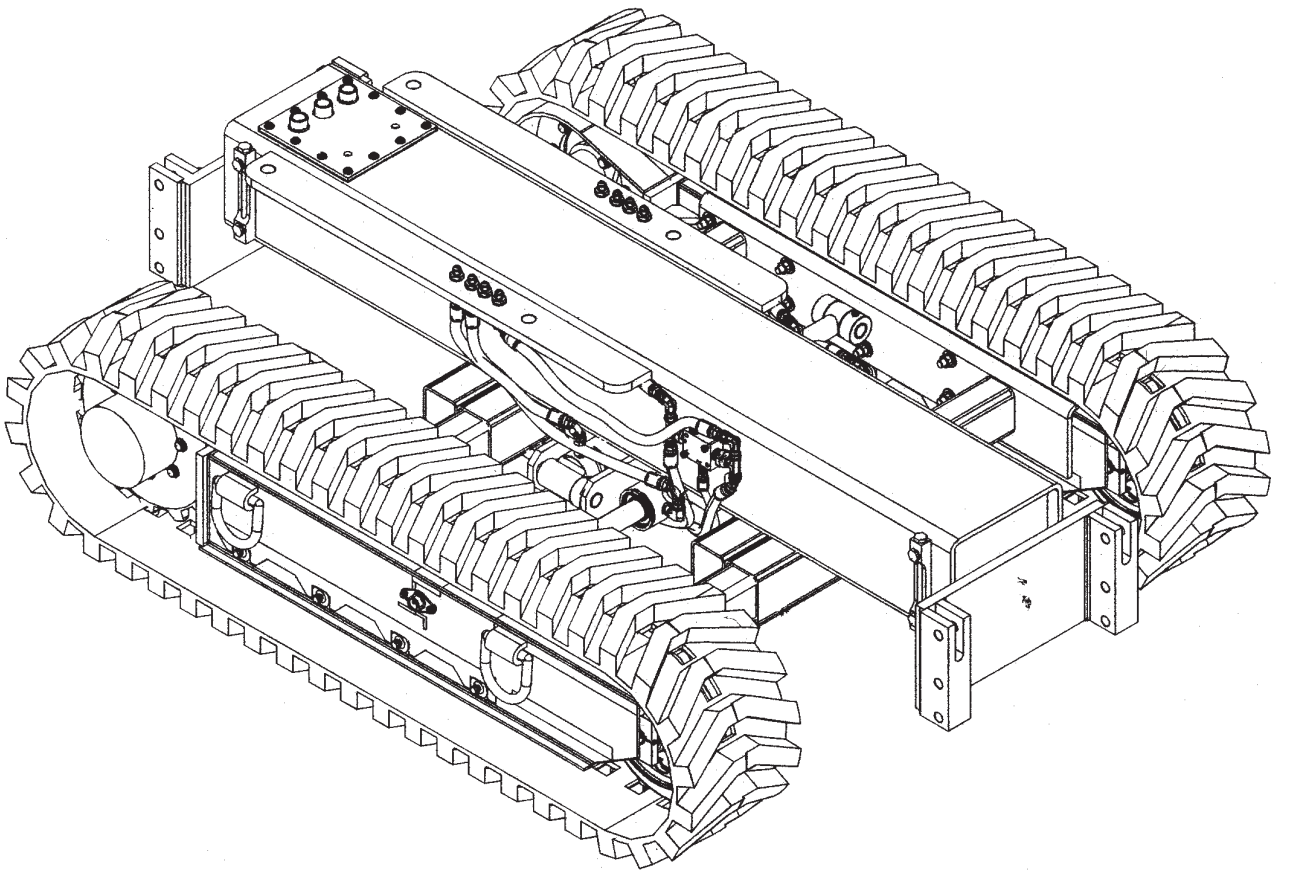
CHERMACK MACHINE, INC.

CUSTOM BUILT TRACKS



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INTRODUCTION

ABOUT CHERMACK MACHINE, INC.

Chermack Machine was founded in 1933 as a machine shop for repair of machinery parts.

After World War II, the company started manufacturing special machinery for a variety of industries. In 1988, the first CNC Lathe was purchase, and the product line was expanded to include production machining.

Today Chermack Machine is a full service facility specializing in CNC machining, welding, assembly, automated sawing and custom prototyping, as well as conventional machining for factory applications. We work with our customers offering design consultation to develop custom parts and assemblies, or to modify and improve existing parts and components.

Chermack Machine is dedicated to exceeding our clients' expectations of quality, reliability and on time delivery with every job.

ASSEMBLY

We are able to manufacture complete assemblies and sub-assemblies. Skilled technicians in our CNC machining, welding and assembly departments build complex assemblies to exacting customer specs. Manufacturing and assembling Custom Built Track Units is our major product line.

APPLICATIONS FOR RUBBER TRACK UNITS

Excavators, Boring/Drilling Machines, Small Cranes, Transporters and Agricultural Machines are popular applications.

Rubber tracks are ideally suited to operate on sidewalks, streets and other finished surfaces and they cause less damage to soil/grassy surfaces than steel tracks.

Rubber tracks will experience severely reduced service life if used on rocky, stumpy or similar high impact surfaces where the rubber is likely to get cut and chunked. In these instances, the cost of steel track with longer service life needs to be evaluated versus the lower cost of rubber track with reduced service life.

The greatest way to obtain maximum track life is to select the proper type track for your application and then follow the recommended operating and maintenance procedures in this publication.

QUALITY

In order to provide our customers with products and services of the highest quality, Chermack machine will strive to understand our customers' needs and expectations, while continuously improving our operations to achieve total customer satisfaction.

SAFETY PRECAUTIONS

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

⚠ DANGER Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

⚠ WARNING Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed.

⚠ CAUTION Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

⚠ WARNING Do not operate, service, inspect or otherwise handle this equipment unless you have read the Owner's Manual Supplied With Your Track Mounted Machine And Have Been Properly Trained In Its Intended Usage.

IMPORTANT: Should You Find A Descrepancy Between the Track Mounted Machine Owner's Manual And This Document, Rely On The Information Supplied By The Manufacturer Of The Machine Or Consult The Factory.

THERE ARE INHERENT HAZARDS ASSOCIATED WITH THE OPERATION OF A TRACK UNIT.

FOR YOUR SAFETY:

-
- Keep All Guards And Shields In Place. Moving Parts Can Crush And Dismember.
- Check That All Connections And Bolts Are Tight Before Operating.
- Check All Hoses And Fittings Before Start-Up And Periodically During Operation.
- Clear The Area Before Equipment Start Up.
- Do Not Allow By Standers Near The Operating Unit.
- Keep Hands, Feet, And Loose Clothing Away From Operating Track Unit. Exposed, Moving Parts Can Crush Or Dismember.
- Use Caution When Traveling Over Uneven Terrain And When Approaching Stops.

THERE ARE ADDITIONAL HAZARDS ASSOCIATED WITH THE SERVICE AND MAINTENANCE OF A TRACK UNIT.

FOR YOUR SAFETY:

- Always Wear Eye Protection When Operating Or Servicing The Unit.

- Do Not Depend On Hydraulic Pressure Applied To Blades Or Backhoe To Elevate Machine For Track Unit Service. Always Service Track Units And Under Carriage From Outside Or From Above The Unit Rather Than From Underneath.
- Escaping Hydraulic Fluid Under Pressure Can Penetrate The Skin And Cause Serious Injury. Relieve All Pressure From The Hydraulic System Before Connecting Or Disconnecting The Lines Or Making Repairs.
- Never Make Any Alterations Or Modifications To This Equipment.

The Complete Observance Of One Simple Rule Would Prevent Many Thousand Serious Injuries Each Year. That Rule Is "NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IN MOTION".

FAILURE TO HEED MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH

CUSTOM BUILT TRACK UNITS

Chermack Machine, Inc. can provide track drive units with rubber track and built to your exacting specifications in any size or style and for most applications. We offer in house development and engineering and will work with your existing design, limiting customer down time and getting your product to market faster.

TRACK CONSTRUCTION

Rubber tracks provide less ground compaction and soil damage as well as increased comfort by less vibration and noise. They allow higher speeds, superior traction, increased pushing or towing capability, lighter weight and are economical. They are low friction drives and result in increased fuel economy.

Tracks are made from natural rubber which provides greater chunking and tear resistance, wear and heat resistance and have self healing properties, which extends the track life.

Rubber tracks are single molded assemblies consisting of a composite of steel cord, surrounded by fabric and incorporates an interlocked forged metal link backbone. The fabric separates the steel cord from the forged metal links which provide flexibility and strength needed for the application.

TRACK MODEL CONFIGURATIONS

Custom under carriage assemblies ready for mounting of your operators station and your implements can be supplied. Basic track units with mounting provisions for assembly to your own under carriage are also possible. See page 8.

All track units are supplied with hydraulic wheel motor driven rubber tracks. The drive sprockets engage every link of the track as opposed to every other link. This reduces the wear on the under carriage of the machine and reduces the torque factor on the inside of the track. This also creates for a smoother ride and less operator fatigue.

TYPICAL UNDER CARRIAGE ASSEMBLIES

Under carriages are provided with mounting arrangements for your operator station and implements per your specification. Hydraulically "on the go" adjustable or fixed track width is available for all under carriages.

Assemblies can be engineered and built ranging from completely configured hydraulic reservoir unit with reservoir, filtration, plumbing and quick connections to your operating controls and implement cylinders or motors as required; to basic track drive only assemblies.

LUG PATTERNS

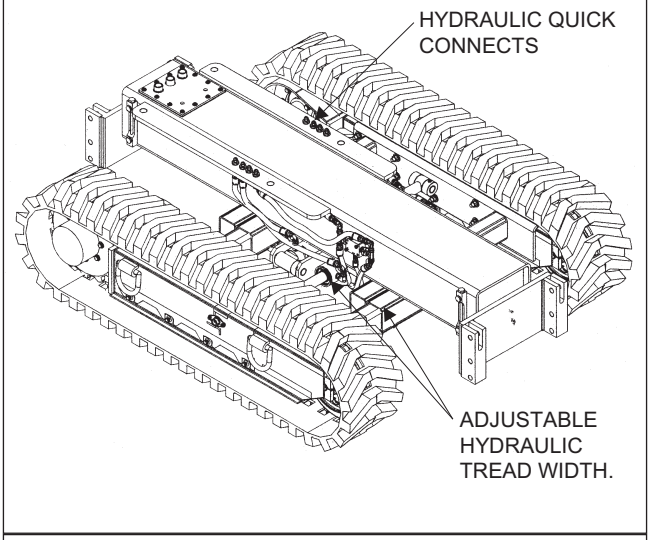

FIGURE 1.
TYPICAL HYDRAULIC RESERVOIR UNIT

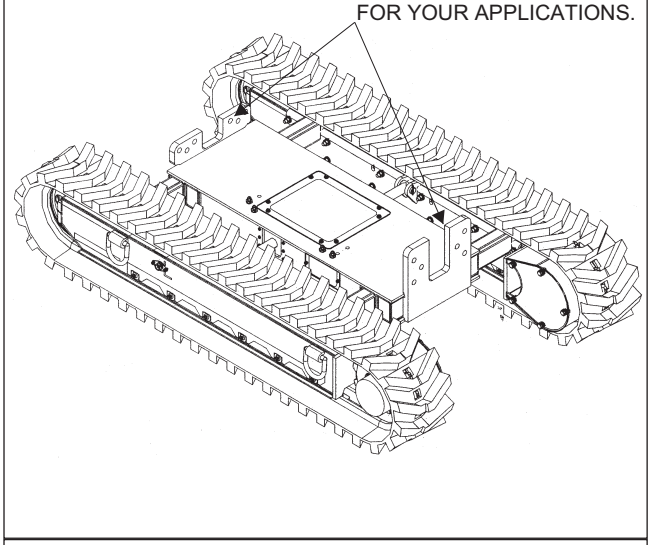

FIGURE 2
TYPICAL BOX FRAME MODEL

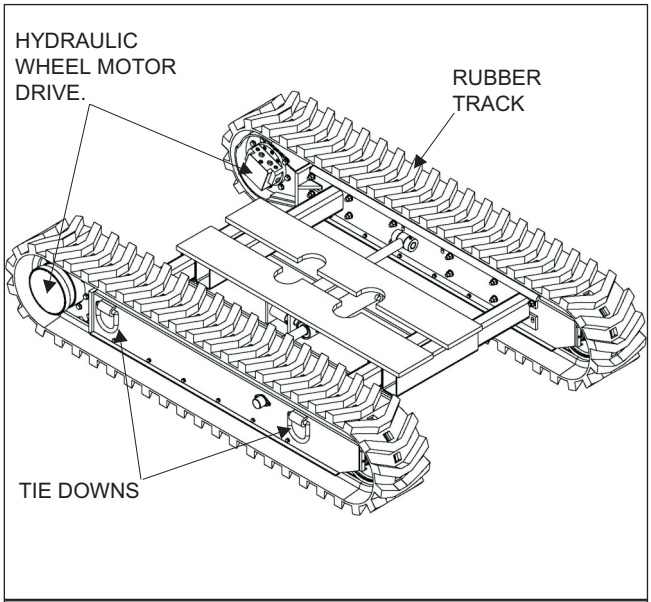

FIGURE 3.
TYPICAL OPEN FRAME UNIT

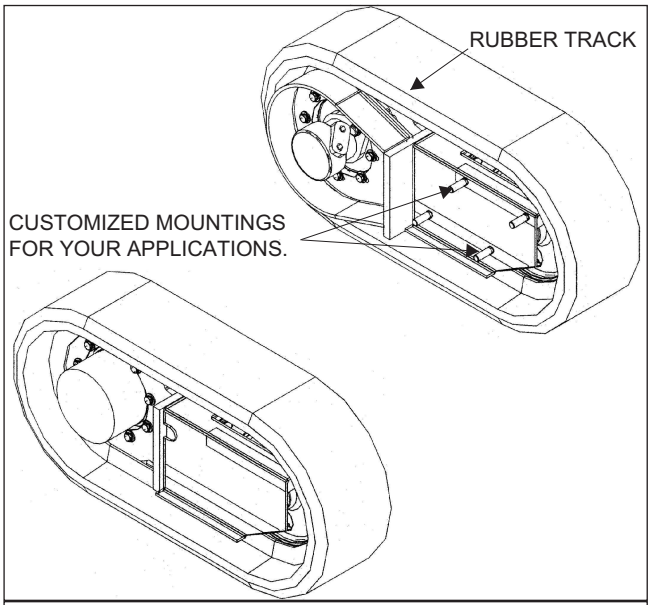

FIGURE 4
TYPICAL BASIC TRACK MODEL

Many lug variations are available. Some popular designs are illustrated on figure 5.

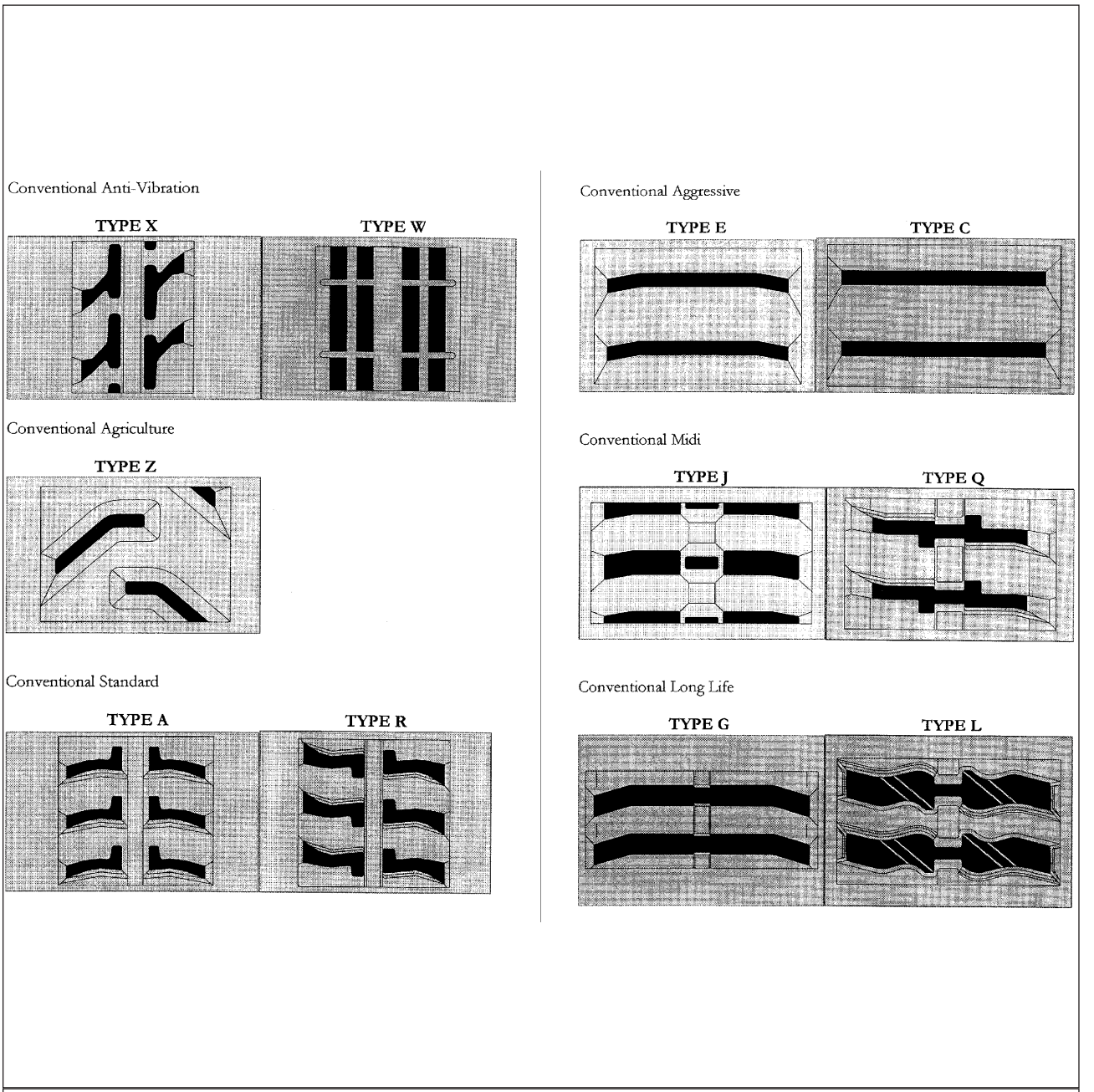

FIGURE 5.
TYPES OF TREAD PATTERNS

TECHNICAL INFORMATION

TRACK MAINTENANCE

The components of the under carriage are open to soil, sand, rock, water, chemicals and the elements because of functional necessity. Regular maintenance of the undercarriage is inevitable. Compensation though, is that the components are readily visible for inspection.

DESIGN CONSIDERATIONS

Many items must be considered and engineered for a track drive unit. Some of them are:

1. Track length, width and pitch
2. Shoe width (no wider than necessary is best)
3. Track design required for machine gross weight and pull
4. Track tensioner design based on application and machine gross weight

PRECAUTIONS/HANDLING RECOMMENDATIONS

Installation and Repair

Only trained personnel should preform the mounting of rubber tracks. Incorrect assembly may result in premature failure and/or damage to the machine.

Tension of Rubber Tracks

Improper tension may result in track alignment problems, detracking and is a major contributor to premature failure. Tension should be inspected regularly and adjusted if necessary. See maintenance section.

WARNING **Loose tracks can allow excessive machine motion resulting in decreased stability during operation.**

Unfavorable Terrain Conditions

Rubber tracks should not be used in certain terrains, because damage can occur to the lug sides of the tracks. Some common and unfavorable terrain conditions are: hard surface roads, rocky fields, stump fields, large ruts or holes, scrap rebar, troughs, crowned ridges and along walls or border stones. Inspect the work site before beginning operation and remove any of these items when possible.

If the rubber tracks must be used in such conditions, avoid making sharp turns, and drive slowly and carefully because detracking could occur.

If rubber tracks are run up against mounds, rocks or concrete walls, a crack may occur at the edges of the rubber tracks. Avoid these circumstances whenever possible.

High abrasion soils like coarse sand and clay will unavoidably reduce track life. High moisture soil will aid mud packing inside the track drive and support rollers. Mud buildup on rollers increases track tension, therefore very regular cleanup is required under this condition.

Operating Tips

⚠ WARNING Operate with tracks fully supported by the ground. "Hanging" tracks compromise stability.

Ideal operation is to keep both tracks equally loaded and both tracks fully and evenly supported by the ground. Since this is not always practical, manage the deviations wisely to conform as closely as possible to ideal conditions. Following are some tips to deal with common deviations, as well as deviations that must be avoided.

Tight turns put torsional loads on the under carriage. If unavoidable, alternate between left and right turns to equalize wear.

Avoid counter rotation maneuvers. This create a very high stress on the tracks and under carriage.

Do not make sharp turns on slopes. Always stop before carefully beginning any turns.

Avoid making quick turns on concrete roads. The high friction between the track and surface may result in detracking or abrasion.

Equalize track wear by making the same amount of right and left turns, the same amount of front to rear wear loading, etc.

Carry only light loads on slopes when required.

If the operation is dozing or similar, alternate the work cycle in both directions to equalize the wear and terrain conditions.

Dig over the idler end of the machine. Digging over the sprocket end applies stress to the track and track drive system. Do not dig over the side of the machine. This places high bending moments perpendicular on the track and is less stable than digging over the end.

⚠ WARNING Digging over the side of the machine compromises machine stability.

Do not apply down pressure to implements that cause loss of traction and track spinning, such as when using a blade to back drag. To back drag, use the "float" mode.

Troughed and crowned surfaces place the load on the edges of the tracks. Avoid these surfaces when possible.

When going from flat to sloped terrain, go up and down the slope, not along the slope, thereby equalizing the load on each track.

FIGURE 6
TERRAIN CONDITIONS

When necessary to operate on slopes and only when safe, alternate directions so equal up slope and down slope time is put on each track.

Avoid non productive travel. Transport track machines by truck or trailer to the job site to prolong track life. Always work in both directions, do not back up to work only in one direction.

Travel in reverse only when required. Less stress is applied to the track in forward and lug patterns are designed for forward travel.

Drive slowly and carefully to avoid unfavorable terrain and obstacles that could damage the track. It is recommended to make multiple large radius turns instead of making single, sharp turns. Make "Y" turns to change direction. Avoid slipping and spinning the tracks.

Drive carefully on rough terrain and gravel surfaces. Do not drive over sharp rocks or other obstructions that can puncture the track or concentrate forces on a small area of the track, ie, drive to keep the full driving surface of the track in contact with the ground.

Drive to avoid turning into obstacles that could contact against the frame causing structural damage. Avoid tight turns that force dirt and debris between the track and track support rollers.

Do not allow obstructions to enter between the track and the track frame or roller support mechanism. Damage will result.

Never allow the edge of the track to ride up onto rocks, curbs, walls or other objects that bend the track edges as shown on figure 6. This will cause the track rubber to shear or crack along the ends of the steel inserts backbone of the track, allowing moisture and contaminents to infiltrate the track. Eventual chunking off of the rubber will ocur and the steel cords will corrode leading to complete failure.

OPERATING ENVIRONMENTS

Temperature

The acceptable temperature range for problem free operation of standard rubber tracks is between -13°F[-25 C] and 131°F[+55 C]. If your application does not occur in this range contact us for special rubber compounds.

Fuel & Oil Contamination

Fuel or hydraulic oil should not be allowed to come in contact with rubber tracks. If such occurs, it should be immediately wiped off or rubber deterioration may occur.

Salty Environment

Salty environments should be avoided because salt and salty air erode the adhesion of rubber to the core metals. After rubber tracks have been used in such conditions, the salt should be removed with high pressure water spray as soon as possible.

STORAGE

If rubber tracks are stored for long periods of time, they should be kept indoors to avoid exposure to direct sunlight and weather conditions to avoid deterioration.

Tracks should be stored on their side. Do not lay flat (as if it were on a machine) unless support has been provided to the inside of the track. This will prevent crimping in the track which could weaken the steel reinforcing cords and reduce track life.

Do not bend the track during storage or it may not track properly when installed.

MAINTENANCE

⚠ WARNING Never attempt to clean, adjust or lubricate a track unit while it is in motion. Failure to heed may result in serious personal injury or death.

GENERAL

Proper tension of the rubber track is essential for maximum track and under carriage life and will result in less down time. See ADJUSTMENTS on page 15.

Over tightening track can accelerate under carriage bearing wear and over stress and stretch or crack the rubber track allowing contaminants to deteriorate the rubber compound and steel reinforcing components.

Loose tracks can derail during turning and can also reduce machine stability during operation. It is also possible for the drive sprocket to slip over the belt driving lugs causing wear to the rubber track and possible failure. Derailing causes track damage.

⚠ WARNING Loose tracks will allow excessive machine motion resulting in decreased stability during operation.

Never repair with used or worn components (idler, sprocket, rollers).

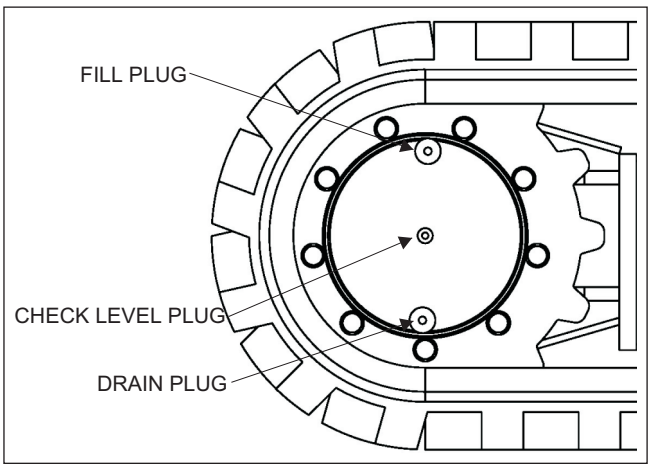

FIGURE 7.
TYPICAL MOTOR LUBRICATION

LUBRICATION

1. Different OEM brand hydraulic wheel motor drives are used on track unit assemblies, but the lubricating procedure is similar. See figure 7.
2. Park the unit so the fill plug is at the top. Some units will have a plug identified as "FILL". If the plug is not identified, the two opposite plugs are the same and either can be positioned at the top.
3. Check oil level at center check plug. Oil should seep out when plug is removed. Top off if required.
4. Lubrication Specifications: Consult the wheel motor manufacturer's instructions for the proper lubricant, quantity and operating temperature range.

ADJUSTMENTS

Inspect Tension

Check the tension at the center track roller every 10 to 15 hours of work. See figure 8. Tension should is by measuring the slack between the track rollers and inside of the track. When correctly adjusted, this slack should be 0.60-0.75 inches. The spring loaded tensioner in the track unit is engineered by Chermack Machine, Inc. to tension the track in proportion to the gross machine weight as required for construction, agricultural and snowfield machinery when the measured slack is as specified.

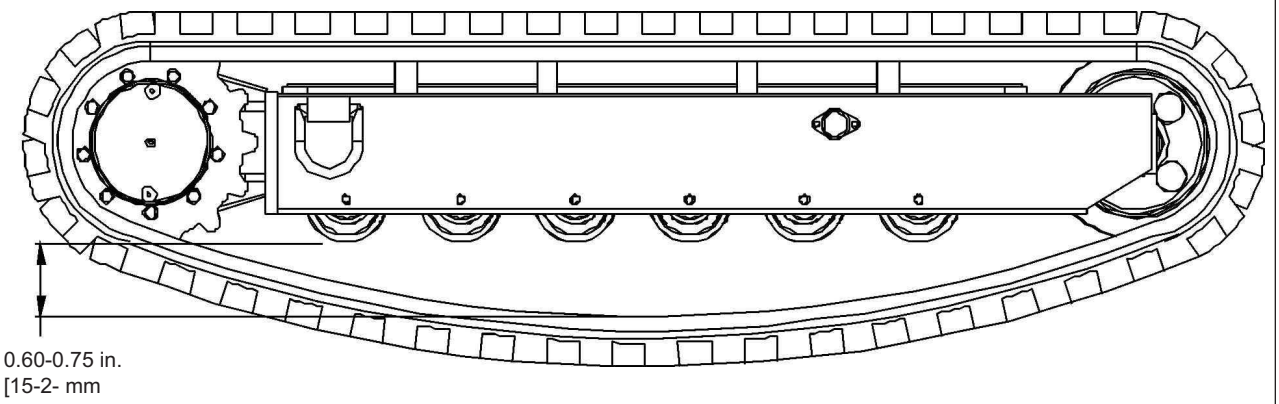

FIGURE 8.
TENSION OF RUBBER TRACK

Adjust Tension

1. Remove the protective cap from the grease valve. See figure 9.
2. Support track assembly so the track clears the ground.
3. Apply a standard grease gun to the grease valve fitting (zerk) and slowly pump grease to extend the track tensioner against the compression spring. Continue to pump grease until the track slack is 0.60-0.75 inches as shown in figure 8.
4. The grease valve has a check valve behind the zerk to prevent grease from coming back under pressure. If it is necessary to release track tension, turn the check valve CCW one half turn and allow grease to expel. Retighten when complete.
5. Lower the track back onto the ground and replace the protective cap.

CLEANING

Keep driving system cleaned and properly maintained. Remove any debris or mud which could interfere with the operation of the machine.

If mud and debris is allowed in the under carriage it can plug the spring loaded tensioner preventing it from relieving stress on the track when traveling over irregular surfaces. Mud can build up on the track rollers thereby over tensioning and stretching the track or the rollers can stop turning and then scrub on the track creating wear and failure.

Wash fuel and oil from the tracks.

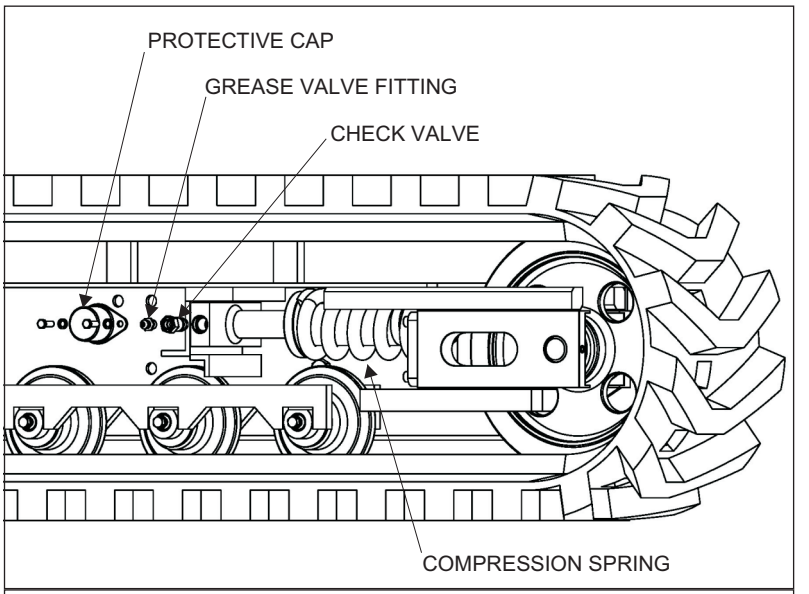

FIGURE 9.
TIGHTENER ADJUSTMENT

REPAIR

In order to prevent bonding or corrosion failures, tracks should be repaired immediately when damaged.

Minor cracks in the rubber can be filled with rubber repair compound.

Once the steel cords have failed, the track is no longer serviceable.

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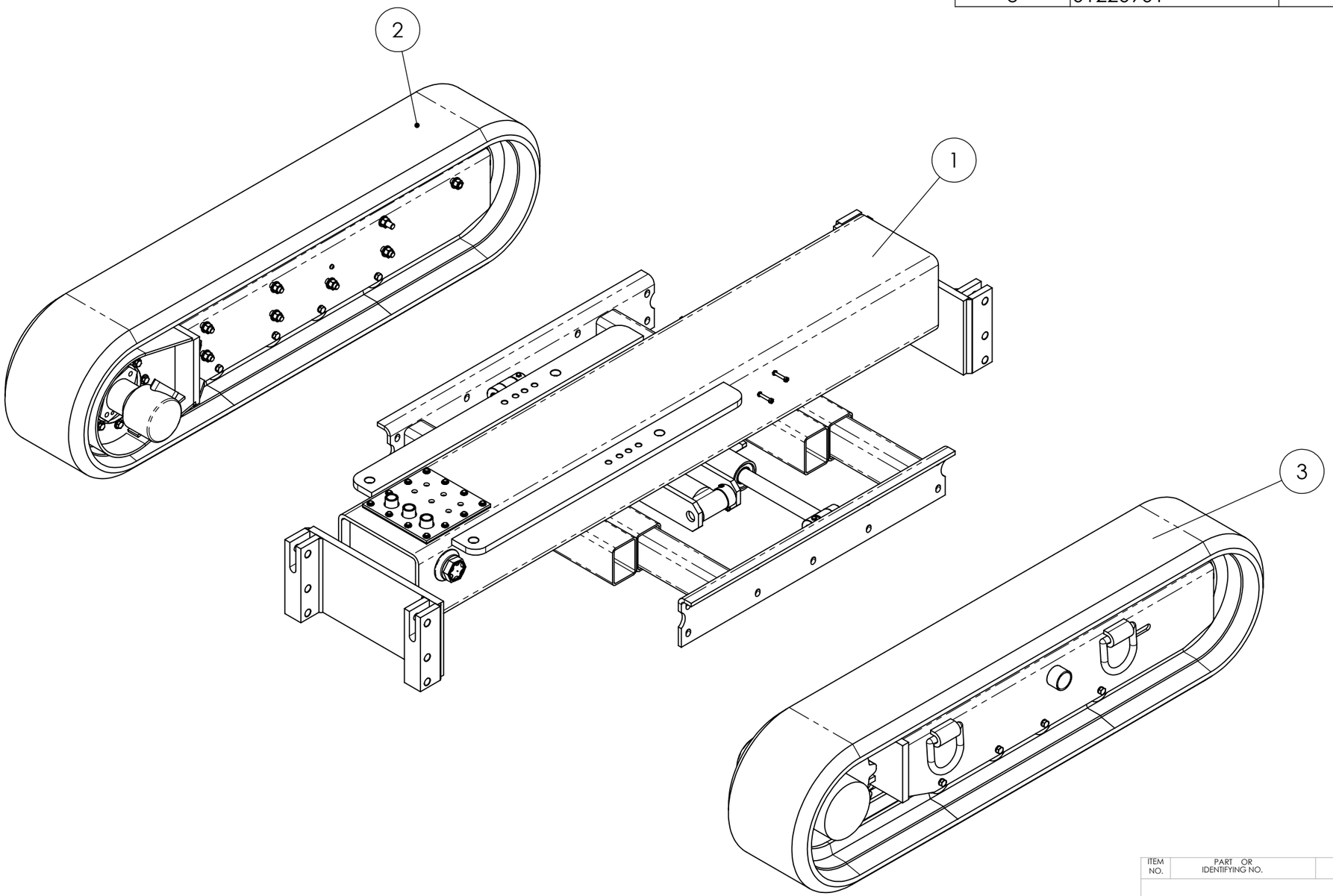
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	10160203	EXPANSION ASSY.	1
2	01220902	LH ASSEMBLY	1
3	01220901	RH ASSEMBLY	1



NOTES:
1. PART TO BE FREE OF BURRS AND SHARP EDGES.

REV	DESCRIPTION	DATE	INIT	NEXT ASSY	USED ON
	REVISIONS			APPLICATION	

ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	QTY REQD
		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX± .02 .XXX± .010 ANGLES ± 1

MATERIAL: SEE PART LIST
FINISH: --
DO NOT SCALE DRAWING

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN LAN	01/30/09
CHECKED	
RESP ENG	
MFG ENG	
QUAL ENG	

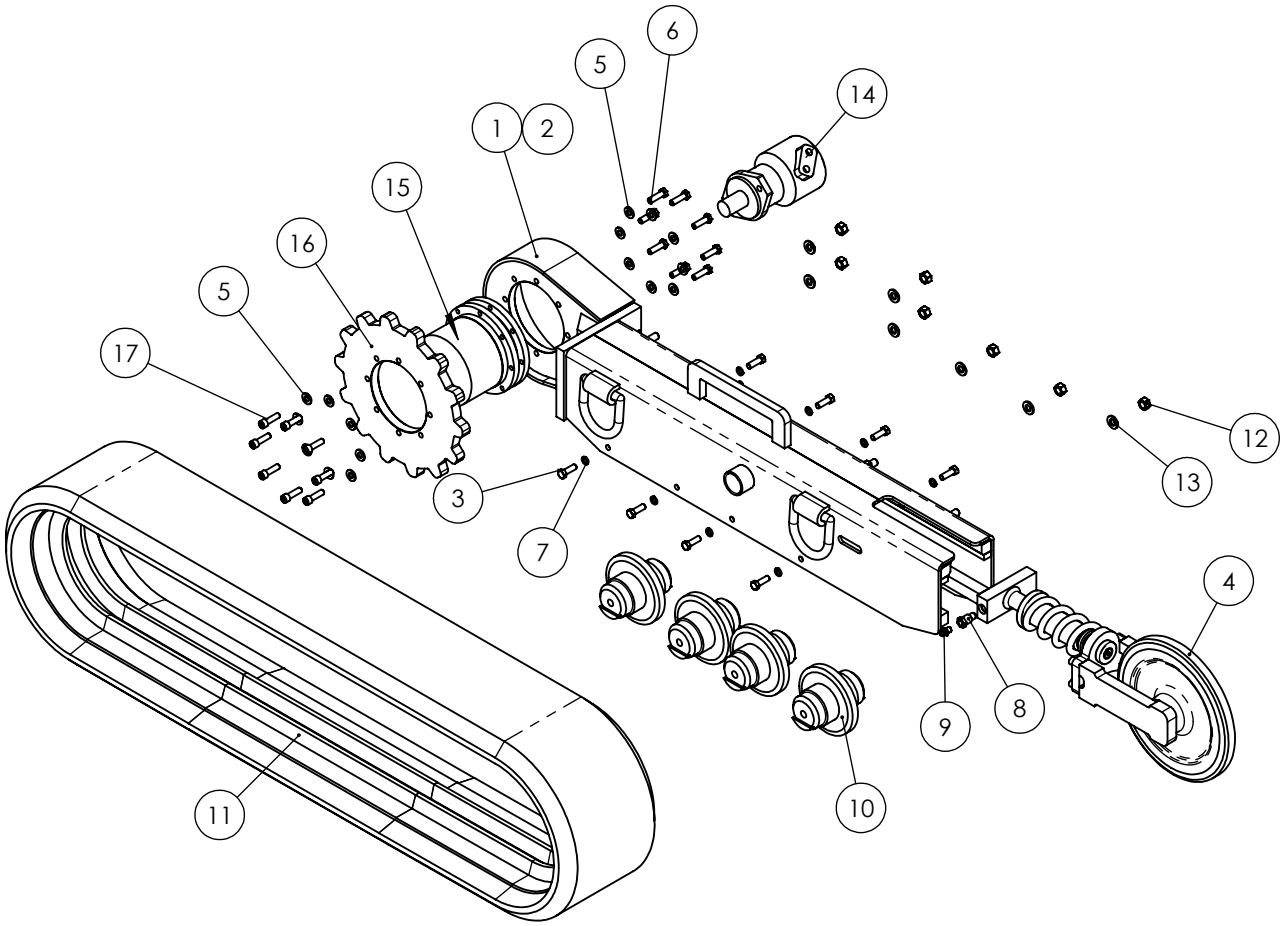
CHERMACK MACHINE, INC.

MAIN ASSEMBLY

SIZE B | DWG. NO. 01220900 | REV. NEW
SCALE 1:10 | CAD FILE: | SHEET 1 OF 1

01220901 - RH ASSEMBLY (SHOWN)
01220902 - LH ASSEMBLY (OPPOSITE)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	01220906	RH TUNNEL WELDMENT -SHOWN	1
2	01220905	LH TUNNEL WELDMENT	1
3	M10 X 25 HHCS	M10 X 1.5 X 25mm LONG	8
4	06010850	LARGE IDLER WHEEL ASSEMBLY	1
5	M10FLAT	10MM FLAT WASHER	16
6	M10X35HHCSZP	M10 X 1.50 X 35MM FULL THREAD HEX BOLT	8
7	M10 LOCK WASHER	M10 LOCKWASHER - ZP	8
8	11280140	CHECK/ A BALL	1
9	1095K16	1/8" NPT STRT W/CAP	1
10	04010701	ROLLER	4
11	04200868	250 X 45 X 72 RUBBER TRACK-NON MARKING	1
12	0800009	1/2-13 HEX NUT	8
13	0800008	1/2" FLAT WASHER	8
14	MOTOR	MLHP 160 G4B	1
15	GEAR	TRACK DRIVE MOTOR	1
16	10160261	DRIVE SPROCKET - PROG	1
17	M10X35SHCS	M10 X 35 SHCS	8



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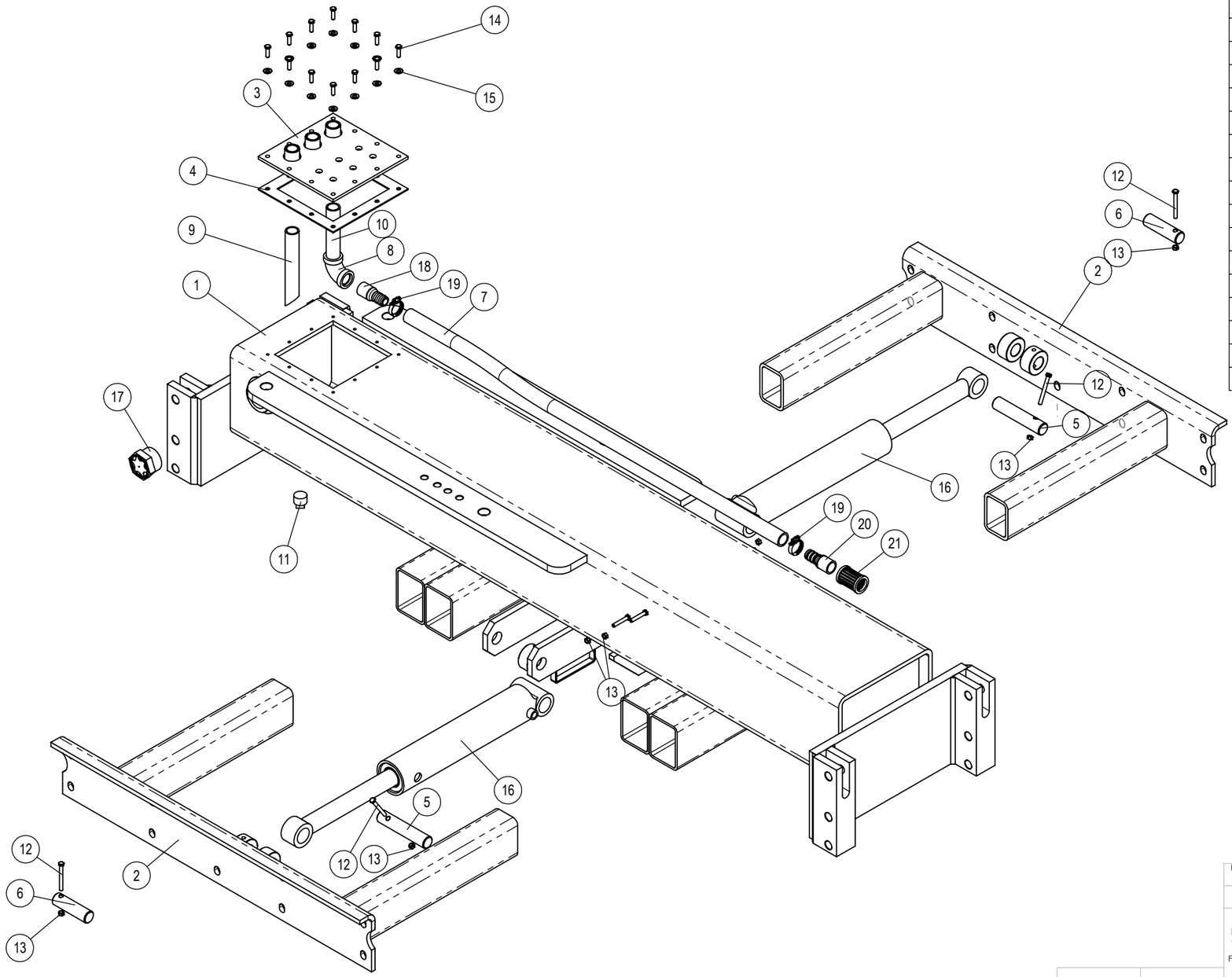

ITEM NO.	PART NUMBER	DESCRIPTION	WIDE/QTY.
1	10160271	CENTER RESERVIOR WELDMENT	1
2	01220908	LH TRACK MOUNT WELDMENT	2
3	10160290	COVER, RESERVOIR	1
4	10160291	GASKET	1
5	10160294	PIN - 1 X 5 CYLINDER	2
6	10160289	PIN - 1 X 3 1/2 CYLINDER	2
7	07250594	1" SUCTION/RET HOSE	1
8	ELBOW_075	ELBOW, 3/4" SHC 40 X 90	1
9	PIPE_02	PIPE	1
10	PIPE_03	PIPE	1
11	12NPTPLUG	3/4" NPT PIPE PLUG	1
12	04080031	1/4-20 UNC X 2 1/2 HHCS ZP	4
13	0400009NYLK	1/4" - NYLOCK	8
14	04032031ZP	HHCS, 1/4-20 UNC X 1.00	12
15	04020SW	1/4 X 5/8 OD SEAL WASHER	12
16	10160288	CYLINDER - 2 1/2" X 9"	2
17	07250541	SIGHT PLUG	1
18	07250591	HOSE BARB, 1" O.D. X 3/4" NPT	1
19	07250593	1" HOSE CLAMP	2
20	07250596	HOSE BARB, 1" O.D. X 1" NPT	1
21	AA5180	ZINGA STRAINER SS10003	1

REV	DESCRIPTION	INIT	DATE
A	UPDATED SUCTION/RETURN COMPONENTS.	INIT	02/05/09

REVISIONS

NEXT ASSY | USED ON

APPLICATION

ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	QTY REQD
		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX± .01 .XXX± .005 ANGLES ± 1

MATERIAL: SEE PART LIST

FINISH: --

DO NOT SCALE DRAWING

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN LAN	03/10/03
CHECKED	
RESP ENG	
MFG ENG	
QUAL ENG	

CHERMACK MACHINE, INC.

EXPANSION ASSY.

SIZE B | DWG. NO. 10160203 | REV. A

SCALE 1:9 | CAD FILE: | SHEET 1 OF 1

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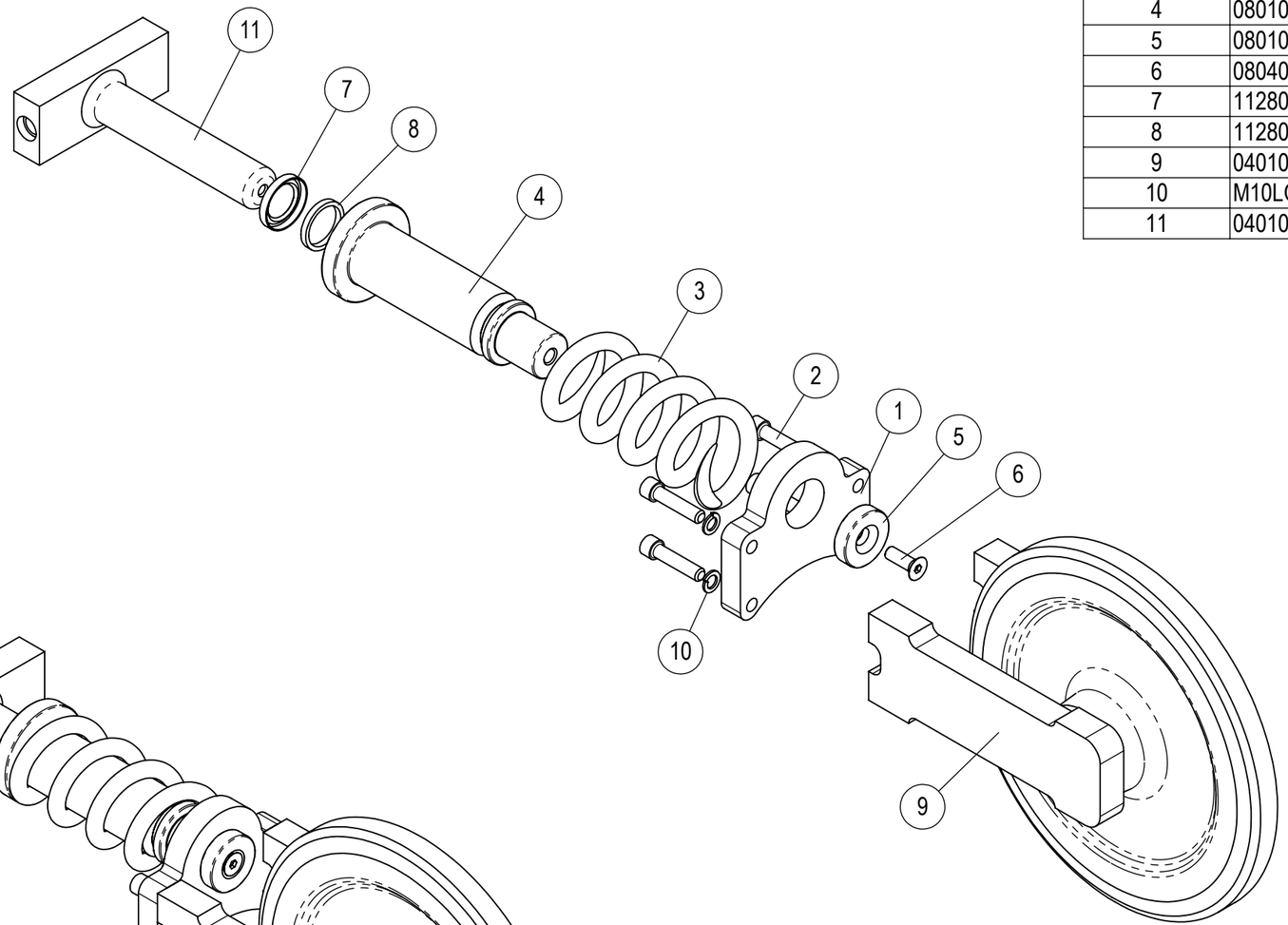
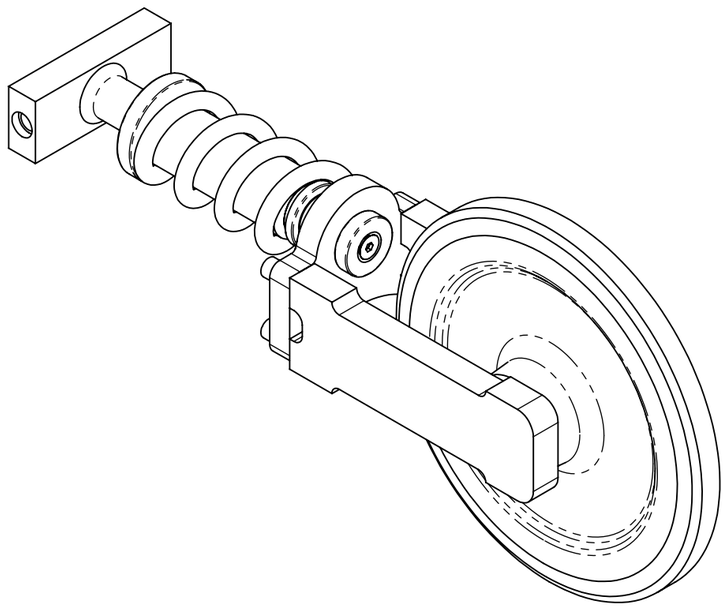
ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY
1	06010823	SPRING TENSIONING FLANGE	1
2	M10X35SHCS	M10 X 35 SHCS	4
3	08010334	COMPRESSION SPRING .656	1
4	08010339	TENTION CYLINDER	1
5	08010346	CYLINDER END WASHER	1
6	08040041	1/2 X 1 1/4 NC FHCS	1
7	11280135	1 1/4 X 1 1/2 X 3/16 POLY U SEAL	1
8	11280134	ST- 125 WIPER	1
9	04010702	LARGE IDLER - BERCO# MU 1676	1
10	M10LOCK	M10 LOCKWASHER	4
11	04010725	TENSIONER, TRACK DRIVE	1





ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	QTY REQD
		PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX± .01 .XXX±.005 ANGLES ± 1

MATERIAL SEE PART LIST

FINISH --

DO NOT SCALE DRAWING

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN LAN	01/20/04
CHECKED	
RESP ENG	
MFG ENG	
QUAL ENG	

NEXT ASSY	USED ON
APPLICATION	

CHERMACK MACHINE, INC.

LARGE IDLER WHEEL ASSEMBLY

SIZE B | DWG. NO. 06010850 | REV. NEW

SCALE 1:4 | CAD FILE: | SHEET 1 OF 1