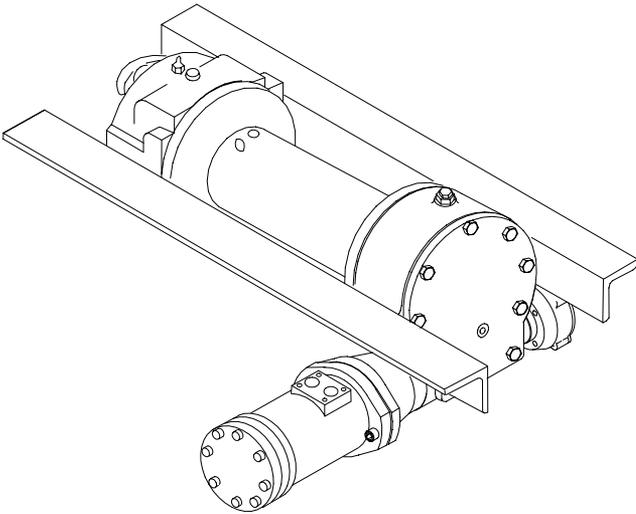




OPERATING SERVICE AND MAINTENANCE MANUAL



MODEL HDG 350 RAM-LOK[®] INDUSTRIAL LOW-MOUNT



***CAUTION: READ AND UNDERSTAND THIS MANUAL BEFORE
INSTALLATION AND OPERATION OF WINCH. SEE WARNINGS!***

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RAMSEY WINCH MODEL HDG-350 RAM-LOK®

PLEASE READ THIS MANUAL CAREFULLY.

This manual contains useful ideas in obtaining the most efficient operation from your Ramsey Winch, and safety procedures one needs to know before operating a Ramsey Winch.

WARRANTY INFORMATION

Ramsey Winches are designed and built to exacting specifications. Great care and skill go into every winch we make. If the need should arise, warranty procedure is outlined on the back of your self-addressed postage paid warranty card. Please read and fill out the enclosed warranty card and send it to Ramsey Winch Company. If you have any problems with your winch, please follow instructions for prompt service on all warranty claims. Refer to back page for limited warranty.

SPECIFICATIONS: CONFORMS TO SAE J706

Rated Line Pull	(lbs.)	.....	10,000			
	(Kg)	.....	4,536			
Gear Reduction	.....					30:1
Weight (without cable)	.....					110 lbs. (50 Kg)
Duty Cycle	(ft.)	.....				183
LAYER OF CABLE			1	2	3	4**
* Rated line pull per layer	lbs.		10,000	8,100	6,900	4,800
	Kg		4,536	3,670	3,120	2,180
* Cable Capacity	ft.		20	50	85	125
	m		6	15	25	37
* Line Speed (at 15 GPM)	FPM		32	38	44	54
	MPM		9,7	11,5	13,3	16,4
* These specifications are based on recommended wire rope of .44 inch dia. extra improved plow steel or equivalent						
** Does not conform to SAE J706 specifications.						

NOTE: The rated line pulls shown are for the winch only. Consult the wire rope manufacturer for wire rope ratings.

TECHNIQUES OF OPERATION

The best way to get acquainted with how your winch operates is to make test runs before you actually use it. Plan your test in advance. Remember, you hear your winch, as well as see it operate. Get to recognize the sounds of a light steady pull, a heavy pull, and sounds caused by load jerking or shifting. Gain confidence in operating your winch and its use will become second nature with you.

The uneven spooling of cable, while pulling a load, is not a problem, unless there is a cable pileup on one end of drum. If this happens reverse the winch to relieve the load and move your anchor point further to the center of the vehicle. After the job is done you can unspool and rewind for a neat lay of the cable.

When pulling a load where there is even a remote chance of cable failure, place a blanket, jacket or tarpaulin over the cable about six feet behind the hook. This will slow the snap back of a broken cable and could prevent serious injury.

NOTE: The Ramsey level winder is an available accessory for tightly respooling unloaded cable onto the drum.

The Ram-lok® semi-automatic clutch allows rapid unspooling of the cable, from cable drum, for hooking onto the load. The clutch is operated by the “T-handle”, located on the end of the winch as follows:

1. TO DISENGAGE CLUTCH, run the winch in the reverse (reel out) direction until the load is off the cable. Pull outward on the clutch handle, rotate it counter-clockwise 90° and release. The clutch is now locked out and the cable may be pulled off by hand.
2. TO ENGAGE CLUTCH, pull outward on the handle, rotate it counter-clockwise 90° and release. Run the winch in reverse until the clutch handle snaps fully in or until the cable drum stops turning. At this point make sure the clutch handle is all the way in. The plastic plug in top of clutch housing may be removed, for inspection of clutch to assure total engagement. After the clutch is fully engaged, the winch is ready for winching in the cable.

WARNINGS

CLUTCH MUST BE TOTALLY ENGAGED BEFORE STARTING THE WINCHING OPERATION.

DO NOT DISENGAGE CLUTCH UNDER LOAD.

DO NOT LEAVE CLUTCH ENGAGED WHEN WINCH IS NOT IN USE.

STAY OUT FROM UNDER AND AWAY FROM RAISED LOADS.

STAND CLEAR OF CABLE WHILE PULLING. DO NOT TRY TO GUIDE CABLE.

DO NOT EXCEED MAXIMUM LINE PULL RATINGS SHOWN IN TABLE.

DO NOT USE WINCH TO LIFT, SUPPORT, OR OTHERWISE TRANSPORT PEOPLE.

A MINIMUM OF 5 WRAPS OF CABLE AROUND THE DRUM BARREL IS NECESSARY TO HOLD THE LOAD. CABLE SETSCREW IS NOT DESIGNED TO HOLD LOAD

WINCH MAINTENANCE

Adhering to the following maintenance schedule will keep your winch in top condition and performing as it should with a minimum of repair.

A. WEEKLY

1. Check the oil level and maintain it to the oil level plug. If oil is leaking out, determine location and repair.
2. Check the pressure relief plug in top of the gear housing. Be sure that it is in good operating condition so that hot oil gasses may escape.
3. Lubricate cable with light oil.

B. MONTHLY

1. Lubricate the various grease fittings located in the cable drum, end bearing, clutch housing or clutch operating linkage. Any good grade of moly-disulfide containing grease is acceptable.
2. Check the action of the sliding clutch, making sure it is fully engaging and disengaging with the cable drum. Remove the plastic plug in top of the housing and observe if the clutch is fully engaging. If clutch is not fully engaging, inspect clutch shifter assembly parts, check for damage or excessive wear and replace as necessary. Observe the jaws on both the clutch and cable drum, checking for rounding of the driving faces. If rounding has occurred they should be replaced immediately.
3. Check the winch mounting bolts. If any are missing, replace them and securely tighten any that are loose. Make sure to use only grade 5 bolts or better.
4. Inspect the cable. If the cable has become frayed with broken strands, replace immediately.

C. ANNUALLY

1. Drain the oil from the winch annually or more often if winch is used frequently.
2. Fill the winch to the oil level plug with clean kerosene. Run the winch a few minutes with no load in the reel in direction. Drain the kerosene from the winch.
3. Refill the winch to the oil level plug with all purpose E.P. 140 gear oil.
4. Inspect frame and surrounding structure for cracks or deformation.
5. Gear wear can be estimated by rocking the drum back and forth and if necessary drain oil and remove cover for closer inspection.

CABLE INSTALLATION

1. Unwind cable by rolling it out along the ground to prevent kinking. Securely wrap end of cable, opposite hook, with plastic or similar tape to prevent fraying.
2. Insert the end of cable, opposite hook end, into the ½" dia. hole in drum barrel. Secure cable to drum barrel, using setscrew furnished with winch. **TIGHTEN SETSCREW SECURELY.**
3. Carefully run winch in the "reel-in" direction. Keeping tension on end of cable, spool all the cable onto the cable drum, taking care to form neatly wrapped layers.

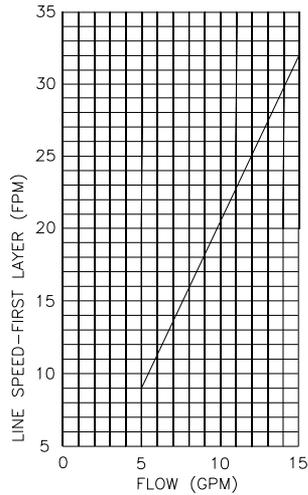
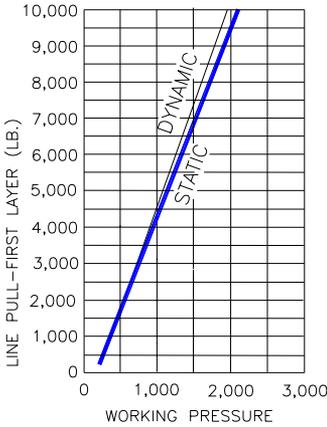
HYDRAULIC SYSTEMS

Refer to performance charts, below, to properly match your hydraulic system to the HDG-350 winch performance. The charts consist of:

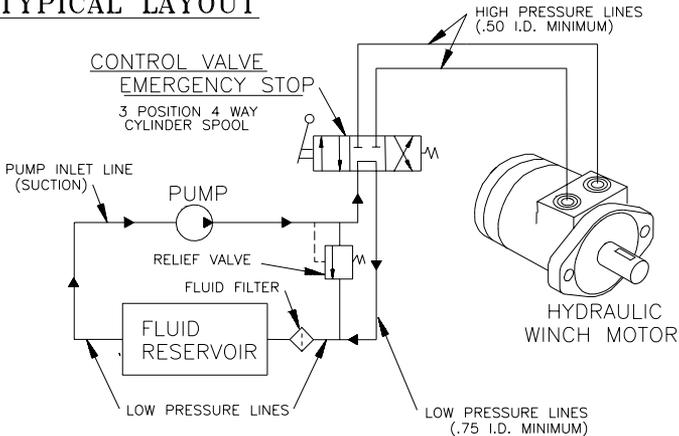
1. Line pull (lbs.) first layer vs. working pressure (P.S.I.). STATIC refers to lifting a suspended load from rest; DYNAMIC refers to maintaining the motion of a moving load.
2. Line speed, first layer (F.P.M.) vs. gallons per minute (G.P.M.).

Performance based on a motor displacement of 3.6 cubic inches with 15 GPM maximum flow rate.

HDG-350R PERFORMANCE
10,000 LB. DUTY RATING
30:1 GEAR RATIO
WITH 3.6 C.I.D. MOTOR



TYPICAL LAYOUT



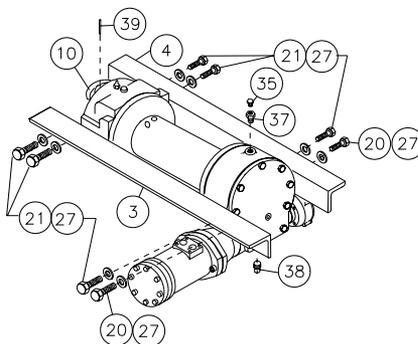
TROUBLE SHOOTING GUIDE

CONDITION	POSSIBLE CAUSE	CORRECTION
Clutch inoperative or binds up.	<ol style="list-style-type: none"> 1. Dry or rusted shaft. 2. Bent yoke or linkage. 3. Clutch jaws are in contact. 	<ol style="list-style-type: none"> 1. Clean and lubricate. 2. Replace yoke or shaft assembly. 3. See Techniques of Operation
Oil leaks from housing	<ol style="list-style-type: none"> 1. Seal damaged or worn. 2. Too much oil. 3. Damaged gasket. 	<ol style="list-style-type: none"> 1. Replace seal. 2. Drain excess oil. Refer to Techniques of Operation. 3. Replace gasket.
Winch runs too slow	<ol style="list-style-type: none"> 1. Hydraulic motor worn out. 2. Low flow rate. 	<ol style="list-style-type: none"> 1. Replace motor. 2. Check flow rate. Refer to Hydraulic Systems flow chart, page 4.
Cable Birdnests when clutch is disengaged.	<ol style="list-style-type: none"> 1. Drag brake disc worn. 	<ol style="list-style-type: none"> 1. Replace discs.
Hydraulic fluid leaks out hole in motor adapter.	<ol style="list-style-type: none"> 1. Hydraulic motor shaft seal damaged. 	<ol style="list-style-type: none"> 1. Replace seal.

INSTRUCTIONS FOR OVERHAUL OF HDG-350

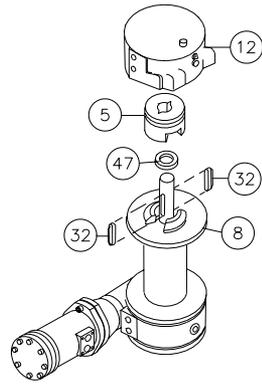
DIS-ASSEMBLY

1. Drain oil from gear housing by removing plug #38 from bottom of gear housing. Remove plugs #35 & #37 from top of gear housing. Remove handle #10 by driving pin #39 from shifter shaft of winch. Remove angles #3 & #4 from winch by removing hardware shown.



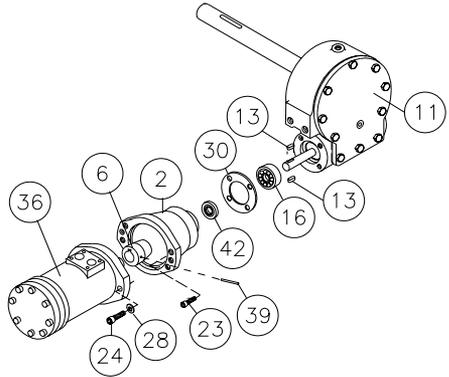
- Remove clutch housing #12 and clutch #5 from winch assembly.

Remove two keys #32 from keyways. A screwdriver can be used, at notch, to aid in the removal of keys. Once keys have been removed, drum #8 and thrust washer #47 can be removed from drum shaft.



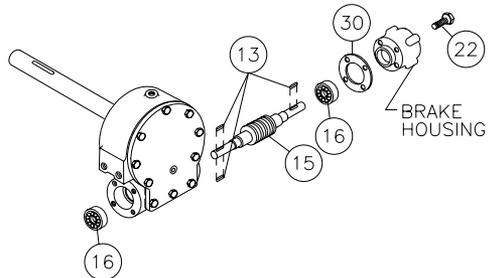
- Remove motor #36 and coupling #6 from adapter #2 by unscrewing two capscrews #24 with lockwasher #28.

Remove keys #13 from worm shaft. Unscrew four capscrews #23 and remove adapter #2 from gear housing. Replace adapter seal #42 and gasket #30.



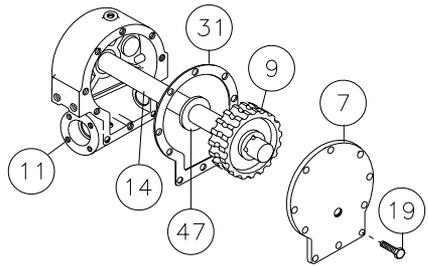
- See page 12 for servicing the oil cooled brake. Remove brake housing mounting screws #22 and remove brake with gasket. Replace gasket #30. Remove worm #15 and bearings #16 from gear housing. Use soft hammer to gently tap input end of worm and drive worm and bearing from gear housing. Once worm has been removed from housing, bearing can be pressed from end of worm.

Check for signs of wear or damage to worm #15 and bearing #16. Replace if necessary.



5. Remove gear housing cover #7 from gear housing #11 by unscrewing capscrews #19. Thread two of the capscrews into the two tapped holes of cover and tighten. This will pull the cover loose from gear housing.

Remove cover gasket #31 and pull shaft #14, with gear attached, and thrust washer #47 from gear housing

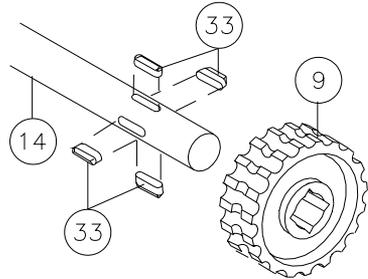


6. Check for signs of wear on gear teeth. If replacement of gear is necessary, replace as follows:

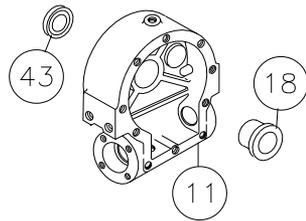
a) Press gear #9 from shaft #14.

b) Examine shaft keys and keyways. If distortion of keys and/or keyways is evident, shaft and keys should be replaced.

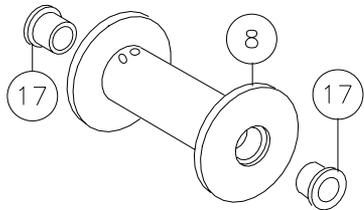
c) Use a soft hammer to gently tap keys #33 into keyways. Press gear #9 over shaft and keys. Gear must be centered over keys.



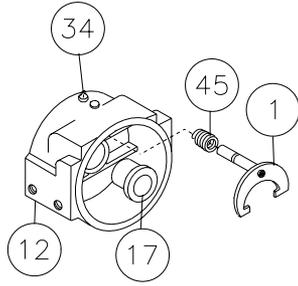
7. Remove seal #43 from back of #11 gear housing. Press bushing #18 from gear housing. Press new bushing and seal back into place.



8. Check drum bushings #17 for signs of wear. Replace if necessary by pressing old bushings from drum. Press new ones into place.

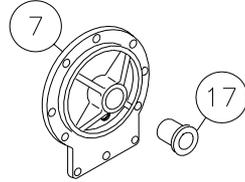


9. Examine shifter assembly #1 for damage to yoke. Yoke should be firmly attached to shaft, yet able to swivel freely around shaft. Replace if necessary.

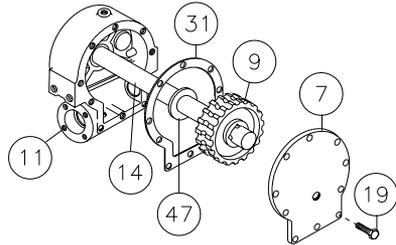


Install new shifter assembly #1 by placing end of shaft, opposite yoke, through spring #45 and into housing #12.

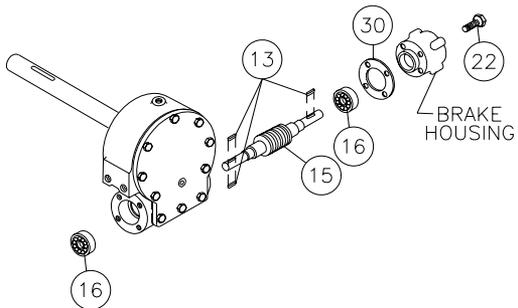
10. Check cover bushing #17 for signs of wear. If necessary remove old bushing and press bushing into place.



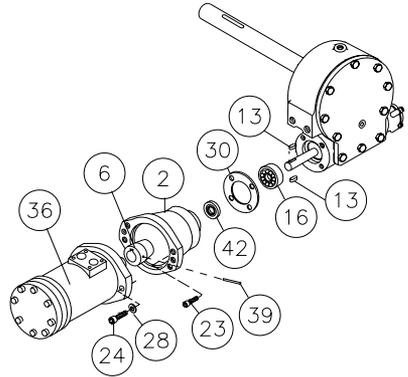
11. Apply grease to end of shaft, opposite gear. Apply grease to bushing in gear housing #11. Place greased end of shaft through thrust washer #47 and bushing in gear housing #11. Place gasket #31 onto gear housing cover #7. Apply grease to gear end of shaft and cover bushing. Place cover onto shaft and secure to housing with ten #19 capscrews. Tighten capscrews to 8 ft. lbs. (10.8 Nm) each.



12. Press bearing #16 onto worm #15
NOTE: Be sure that thick shoulder of bearings outer race (side with manufacturer's name and part number) is out, away from worm threads. Press bearing and worm into gear housing. Slip new gasket #30 onto brake housing. Use four capscrews #22 to secure brake housing to gear housing. **TIGHTEN CAPSCREWS TO 8 FT. LBS. (10.8 Nm.) EACH.** See re-assembling and checking the brake on page 13 to complete brake assembly.

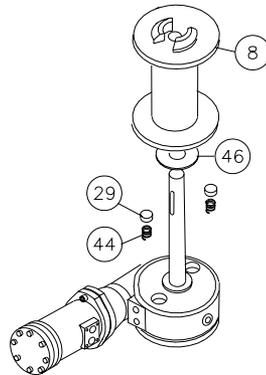


13. Press bearing #16 onto worm and into housing. **NOTE:** Be sure that thick shoulder of bearings outer race (side with manufacturer's name and part number) is out, away from worm threads. Place gasket #30 onto adapter #2. Attach adapter to gear housing using four (4) capscrews #23. TIGHTEN CAPSCREWS TO 12 FT. LBS. (16.3 Nm.) EACH. Insert keys #13 into keyways of worm shaft. Slide tapered end of coupling #6 over end of worm shaft. Be sure roll pin #39 is in coupling.



Place motor shaft, with key in keyway, into coupling. Secure motor to adapter, using two (2) capscrews #24 and lockwashers #28. TIGHTEN CAPSCREWS TO 75 FT. LBS. (102 Nm.) EACH.

14. Place winch with gear housing cover down on work bench. Drum shaft should be in vertical position. Slide thrust washer #46 over drum shaft and slide downward until washer rests on gear housing. Set springs #44 into pockets of gear housing with drag brakes #29 on top of springs. Slide drum assembly #8 onto drum shaft with drum jaws upward.

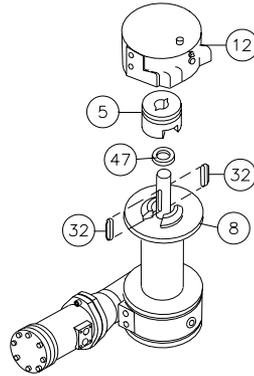


15. Place thrust washer #47 over end of drum shaft and slide downward until spacer rests on drum. Press drum downward to compress springs in gear housing.

Insert keys #32 into keyways with sharp edge of keys pointing outward and notched end of keys upward. A rubber or brass mallet will be needed to gently tap keys into position.

Apply grease to keys and end of shaft. Place jaw clutch #5 over end of shaft and slide jaw clutch over keys.

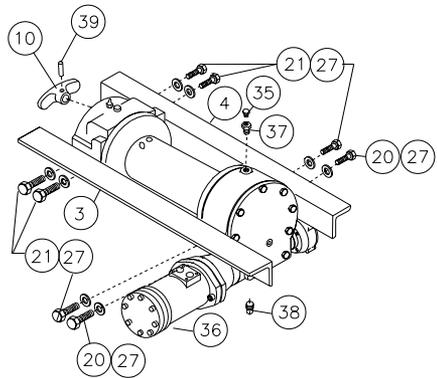
Set clutch housing #12 over end of drum shaft. Pull jaw clutch #5 upward, toward clutch housing, enough to allow yoke, in clutch housing, to fit properly in groove around jaw clutch.



16. Attach angles #3 & #4 using six capscrews #21 with lockwashers #27 and two capscrews #20 with lockwasher #27. Torque capscrews to 34 ft. lbs. (46 Nm.) each. Insert plug #38 into bottom of gear housing. Permatex may be applied to threads to help prevent leakage.

Attach handle #10 to clutch shaft using pin #39.

Pour 1 pint of SAE 140 EP gear oil into housing through hole in top of housing. Insert relief fitting #35 into reducer #37. Reducer should then be placed into hole on top of gear housing. Tighten fitting and reducer securely.



ADJUSTING THE OIL COOLED WORM BRAKE

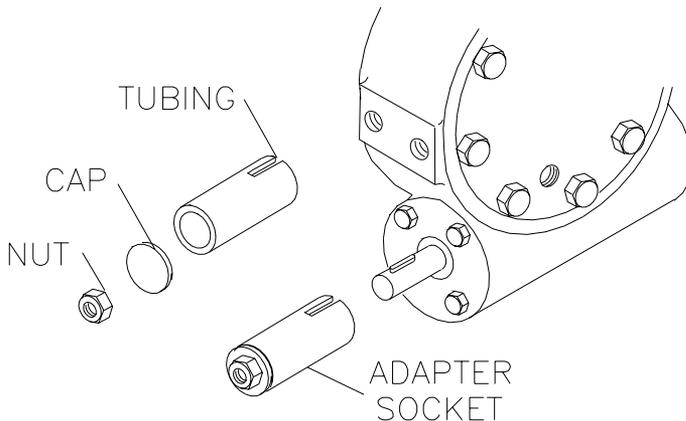
The oil-cooled, fully adjustable, automatic brake operates in the worm housing lubricant, all parts being submerged in oil. When the brake wears to the point that the load begins to drift, the brake can be adjusted as follows:

1. Loosen the lock nut on the adjusting screw.
2. Tighten the brake by turning the adjusting screw clockwise. **CAUTION:** Only $\frac{1}{4}$ turn is usually required to adjust the brake. Over-tightening can cause overheating, and damage to the brake parts. Tighten the lock nut after adjustment is completed.

If the brake does not respond to adjustment then a new leaf spring and brake disc is needed.

A torque wrench can be equipped with a special adapter to fit the input shaft (worm) of the winch. The adapter can be made by welding a nut to the end of a piece of tubing as shown below.

After welding the cap and nut to the tubing, slot the tubing as shown. This will allow the special adapter to slide over the keyway and will then act as a large socket. A torque wrench can then be used to apply the proper torque. Turn the torque wrench so that the drum turns in the spool out direction or lowering direction. The torque rating for the Model HDG-350 should be 9 to 15 ft. lbs. If the torque wrench does not show the proper value as it turns, then the worm brake adjusting bolt should be turned clockwise $\frac{1}{4}$ turn to increase the torque setting. Each time the adjusting bolt is turned, check the torque reading. Continue this procedure until the proper torque reading is achieved. Then tighten the lock nut.



SERVICING OF THE OIL COOLED BRAKE

1. Back off the lock nut, then the adjusting screw, both two turns or more by turning them counter-clockwise.
2. Remove the cover mounting screws.
3. Remove the cover along with coil spring and leaf spring.
4. Remove the retainer plate, composition brake disc, cam plate and balls.
5. Inspect parts as follows:
 - a. Composition brake discs are 1/8" thick when new. Replace if thinner than 0.080" or if surfaces are glazed or burnt.
 - b. Inspect the flat, ground surface of the cam plate and retainer plate for glazing, warpage, or other damage. Glazing can be removed by scraping carefully.
 - c. Inspect the leaf spring. It should be bowed 1/8".

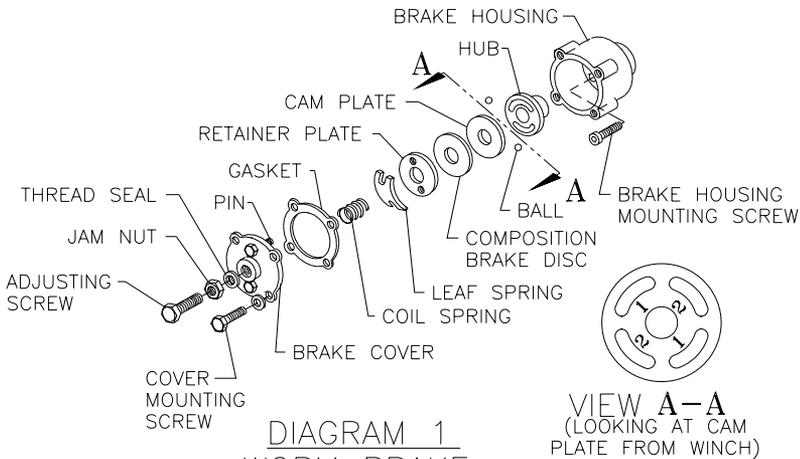


DIAGRAM 1
WORM BRAKE

RE-ASSEMBLING AND CHECKING THE BRAKE

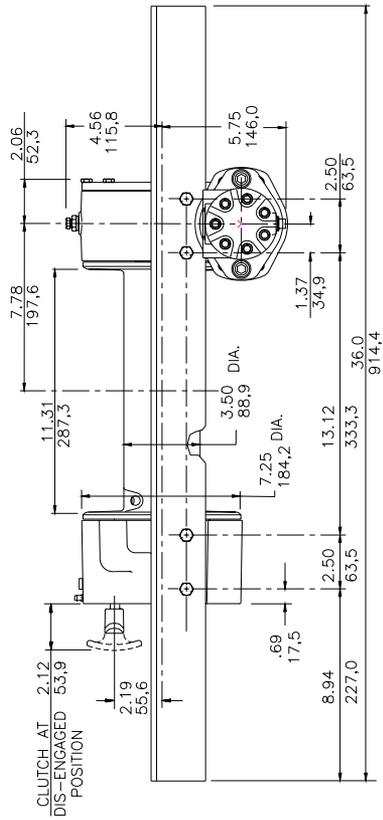
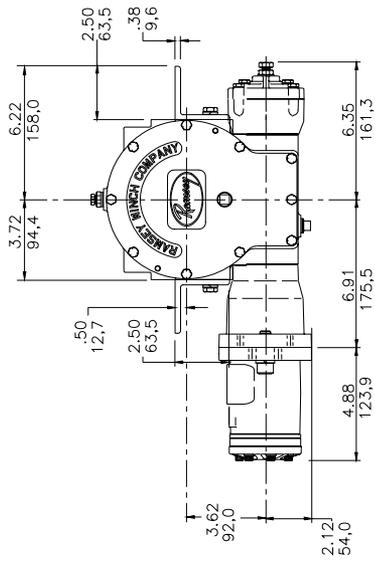
1. Press brake hub into place over worm shaft and key.
2. Assemble balls into appropriate slots of cam. Use stiff grease to hold balls into place and slide cam over end of worm. Be sure that balls are secure, between cam slots and hub slots. Refer to Diagram 1 on page 12.
3. Install brake disc.
4. Install retainer plate, smooth side toward brake disc.
5. Install the gasket on the cover with a small amount of grease or sealer
6. The coil spring goes over the adjusting screw on the inside of the cover.
7. Install the notches of the leaf spring on the pins protruding through the cover. The hollow side of the leaf spring goes toward the brake.
8. Install brake housing cover, making sure the protruding pins go through the leaf spring and into the holes on the retainer plate. Tighten capscrews to 7-8 ft. lbs.
9. Bolt cover into place with the mounting screws. Install drain plug and add 1 pint of SAE 140 EP oil.
10. Turn winch in the reel in direction at least one turn of the input shaft.
11. Turn the adjusting screw in until it is finger tight.

TEST FOR PROPER BRAKE ASSEMBLY

After the brake has been adjusted to the proper torque setting (See page 11), disengage clutch. Start vehicle engine and run winch in the reel in direction. Allow winch to run in this direction for one minute.

Place your hand on the brake housing. If housing is not hot to the touch then run winch in the reverse direction (cable out) for one minute. Brake housing should begin to heat.

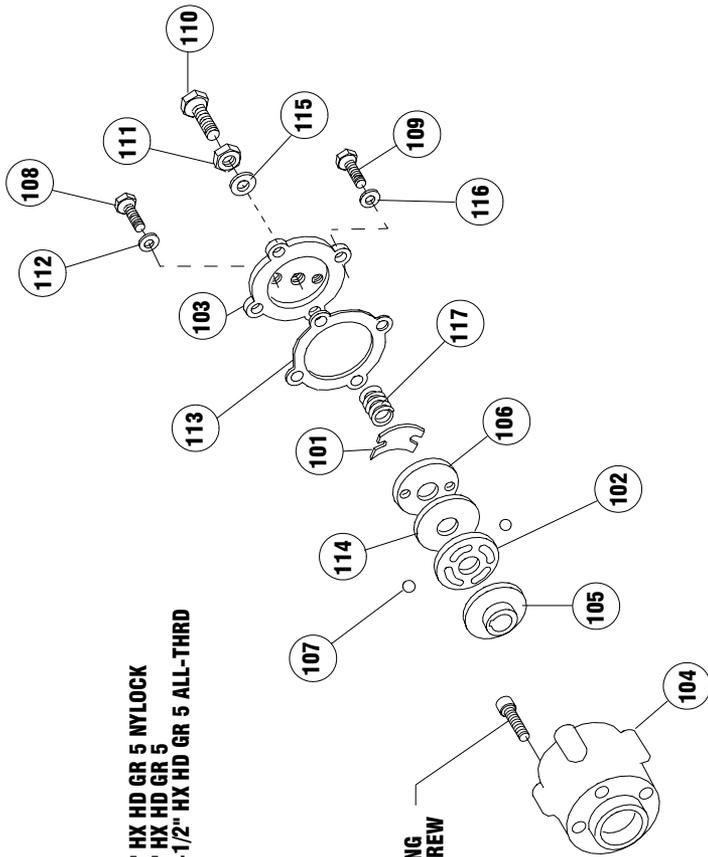
When these conditions exist, proper installation has been made. If heating becomes noticeable when running the winch in forward rotation (reel in direction) the brake should be disassembled. When disassembled, place the brake balls in the alternate set of slots in the cam plate, then carefully follow the instructions for reassembling and checking the brake.

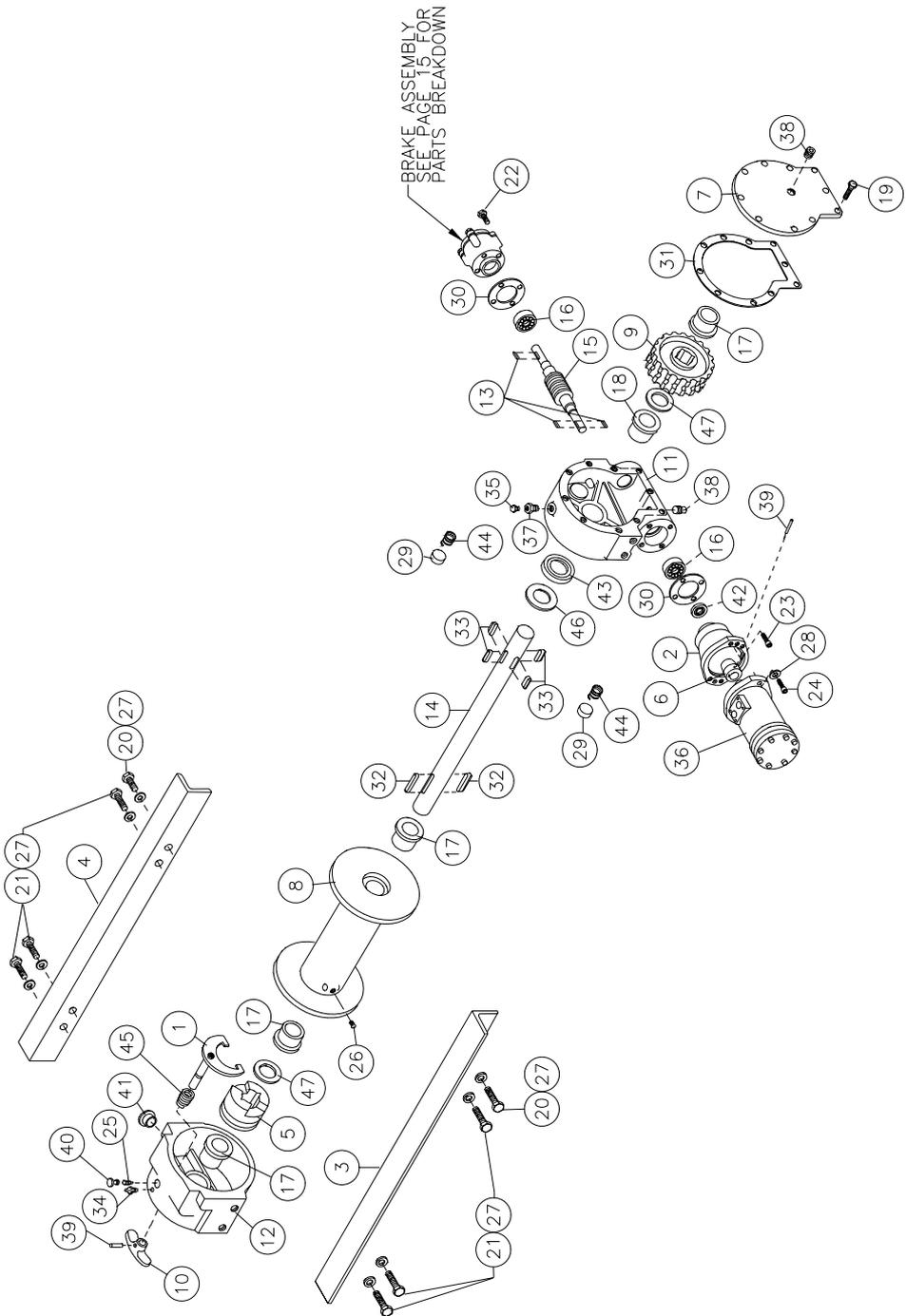


DIMENSIONS SHOWN ARE INCHES OVER MILLIMETERS

MODEL HDG-350 RAM-LOK

ITEM NO.	QTY	PART NO.	DESCRIPTION
101	1	306034	SPRING - FLAT
102	1	314008	CAM PLATE
103	1	328128	COVER
104	1	338007	HOUSING - BRAKE
105	1	340002	HUB
106	1	352022	RETAINER PLATE
107	2	400003	BALL
108	2	414021	CAPSCREW 1/4-20NC X 1" HX HD GR 5 NYLOCK
109	4	414039	CAPSCREW 1/4-20NC X 1" HX HD GR 5
110	1	414224	CAPSCREW 3/8-16NC X 1-1/2" HX HD GR 5 ALL-THRD
111	1	418036	NUT 3/8-16NC HX JAM
112	2	418154	WASHER - FLAT 1/4 ALUM
113	1	442189	GASKET
114	1	474001	PLATE - THRUST
115	1	486069	THREAD SEAL
116	4	486070	THREAD SEAL
117	1	494007	SPRING





PARTS LIST MODEL HDG-350

ITEM	QTY	PART	DESCRIPTION	ITEM	QTY	PART	DESCRIPTION
1	1	276056	SHIFTER ASSEMBLY	25	1	416030	SETSCREW 1/4-20NC X 3/8 HEX SOC
2	1	300057	ADAPTER	26	1	416059	SETSCREW 3/8-16NC X 1/2 LG SOC HD LESS
3	1	303076	ANGLE	27	8	418177	LOCKWASHER 3/8 MED SECT
4	1	303077	ANGLE	28	2	418218	LOCKWASHER, 1/2 MED SECT
5	1	324160	JAW CLUTCH	29	2	438014	DISC - BRAKE
6	1	324500	COUPLING	30	2	442184	GASKET
7	1	328134	COVER	31	1	442205	GASKET
8	1	332105	DRUM	32	2	450006	KEY - BARTH
9	1	334179	GEAR - R.H. 30:1	33	4	450016	KEY - BARTH
10	1	336010	HANDLE	34	1	456001	FITTING - LUBE
11	1	338273	HOUSING - GEAR	35	1	456008	FITTING - RELIEF
12	1	338308	HOUSING - CLUTCH	36	1	458111	MOTOR
13	3	342027	KEY	37	1	468002	REDUCER
14	1	357487	SHAFT - DRUM "STD"	38	2	468011	PIPE PLUG
15	1	368202	WORM - R.H. 30:1	39	2	470033	SPIROL PIN
16	2	402002	BEARING - BALL	40	1	472012	PLUG - RUBBER
17	4	412003	BUSHING	41	1	472013	PLASTIC SEAL
18	1	412097	BUSHING	42	1	486009	OIL SEAL
19	10	414045	CAPSCREW 1/4-20NC X 7/8 LG HX HD GR 5	43	1	486017	OIL SEAL
20	2	414275	CAPSCREW 3/8-16NC X 7/8 LG HX HD GR 5	44	2	494002	SPRING
21	6	414282	CAPSCREW 3/8-16NC X 1-1/4 LG HX HD GR 5	45	1	494053	SPRING
22	4	414839	CAPSCREW 1/4-20NC X 7/8" BUTTON HEAD	46	1	518014	THRUST WASHER
23	4	414842	CAPSCREW 1/4-20NC X 1-3/4 LG SOC HD L/W	47	2	518015	THRUST WASHER
24	2	414852	CAPSCREW 1/2-13NC X 1-1/2 LG SOC HD Z/P				

LIMITED WARRANTY

RAMSEY WINCH warrants each new RAMSEY WINCH to be free from defects in material and workmanship for a period of one (1) year from date of purchase.

The obligation under this warranty, statutory or otherwise, is limited to the replacement or repair at the Manufacturer's factory, or at a point designated by the Manufacturer, of such part that shall appear to the Manufacturer, upon inspection of such part, to have been defective in material or workmanship.

This warranty does not obligate RAMSEY WINCH to bear the cost of labor or transportation charges in connection with the replacement or repair of defective parts, nor shall it apply to a product upon which repair or alterations have been made, unless authorized by Manufacturer, or for equipment misused, neglected or which has not been installed correctly.

RAMSEY WINCH shall in no event be liable for special or consequential damages. RAMSEY WINCH makes no warranty in respect to accessories such as being subject to the warranties of their respective manufacturers.

RAMSEY WINCH, whose policy is one of continuous improvement, reserves the right to improve its products through changes in design or materials as it may deem desirable without being obligated to incorporate such changes in products of prior manufacture.

If field service at the request of the Buyer is rendered and the fault is found not to be with RAMSEY WINCH'S product, the Buyer shall pay the time and expense to the field representative. Bills for service, labor or other expenses that have been incurred by the Buyer without approval or authorization by RAMSEY WINCH will not be accepted.

See warranty card for details.



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