



ENGINEERED TO WIN!!!

2019

OPEN WHEEL MODIFIED



Manufactured By:
Bernheisel Race Cars
1 Bordnersville Rd.
Jonestown, Pa 17038
Phone 717-865-3119
Fax 717-865-0904
E-mail lazerchassis@comcast.net



Dear Valued Customer,

Congratulations on your purchase of a precision crafted Lazer Racing Chassis by Bernheisel Race Cars. We take great pride in supplying the high level of quality and service our customers have come to know and expect.

On the bottom of this page is your chassis serial number. Please refer to this number when calling for parts or technical assistance.

Our goal is to help you improve your racing program no matter what level you are now racing at. The following pages should assist you in that regard. You are also welcome to access our website @ www.bernheiselracecars.com or call our tech line at 717-865-6691 for further information.

Thank you and Good Luck. Jim Bernheisel-president

Customer:

Serial:

Date:

DISCLAIMER OF WARRANTY

AUTO RACING IS A DANGEROUS SPORT.

THE SELLER HEREBY EXPRESSLY DISCLAIMS ALL WARRANTIES, EITHER EXPRESSED OR IMPLIED. INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE SELLER NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF THIS MERCHANDISE.

THE PURCHASER ASSUMES ALL RESPONSIBILITY

Front Suspension

I. Front Suspension

A. Upper Control Arms– Bottom holes front, Top holes rear on chassis brackets

1. Small Screw-in Holder
2. R.S.– 5” Tube Front 6” Tube Rear
3. L.S. Legs– 6” Tube Front 7” Tube Rear
4. Center of Heim to Center of Ball Joint (front),
Center of Heim to Center of Clevis (rear)

	R.S.	L.S
Front–	8 1/4”	10 1/2”
Rear–	9”	11”

B. Lower control arms– Tubular Left 88010, Right 88020

C. Steering

78-88 GM Metric

- Sweet Steering Box (no quickner)
- Center Link– Howe precision recommended
- Idler Arm- Howe precision recommended

D. Tie Rods– Howe LH tie rod at center link, 5/8” RH heim at spindle

Stock tie rods may require a shorter tube

1. L.S.-16” Rod @19 3/4” on Center (use to set toe)
2. R.S.-15 1/2” Double Bend Rod @ 19 3/4” on Center

E. Alignment

1. Camber– right side– 5 degrees / left side– 3 degrees
2. Caster– right side– 6 degrees / left side– 3 degrees
3. Toe 1/4” out
4. Bump Steer-Spacers R.S. 2 1/8” / L.S. 1 1/2” (under steering arm)
 - a. Howe idler arm adjusted all the way down
 - b. Howe center link with shims in stock position
 - c. All information is a guideline. You must check bump after finally assembly.

F. Spindles

1. Pinto/Mustang II
2. Reamed for Screw-in Ball Joints, Top Small / Bottom Large
3. Drill steering Arm to 5/8”

G. Front Ride Height– with UMP/open e-mod style tires

1. Right- Ground to Bottom of Metric Main Frame - 6 1/8”
2. Left- Ground to Main Frame - 6”

H. Misc.

1. Use 1” Extended Upper Ball Joint Pin
2. Motor Plate Location
 - a. Top holes (lower in car) no spacers on front mounts– recommended
 - b. Lower holes (higher in car) 1” spacers on front mounts

4 Link Rear Suspension

II. 4 Link Rear Suspension– 60” centered Rear Housing

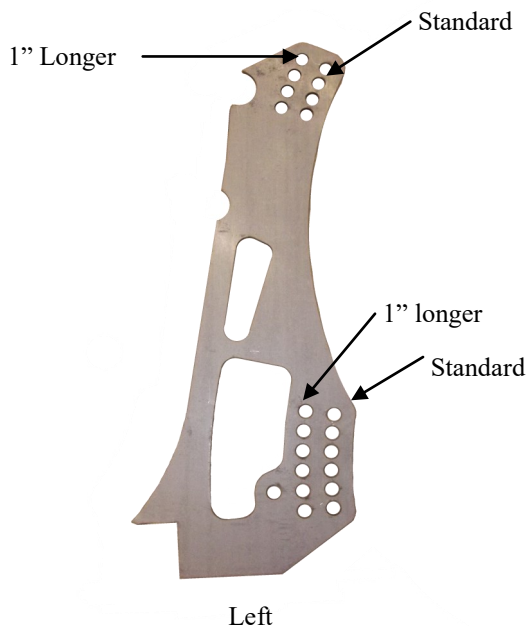
- A. Lift bar
 - 1. 400# 5” 6th coil or medium rubber biscuit
 - 2. 250# 11” 5th coil– 3/8” preload
 - 3. 5th coil mounted in 2nd hole from rear
 - 4. 9” shock
 - 5. Side support bar– 7” tube, 10” on center
 - 6. 1” spacers between lift bar and rear end plates
- B. Rear End Adjustment (side to side)
 - 1. Left upper torque arm plate to left ride height tab-14” depends on LR bite and ride height
 - 2. Panhard bar- j-bar mounted on back side of frame plate
 - a. R.S. of Rear 1 1/4” from the bottom of the slot to the center of the bolt (back side)
 - b. Frame –1 spot (below 0) on slot left side of frame
 - c. Center to center 22”
- C. Rear Ride Height– tab to top of birdcage body
 - 1. Over rail rear clip
 - a. Left 10 3/4”
 - b. Right 10 ”
- D. Pinion Angle– 7.5 degrees negative, set lift bar level with frame using the 6th coil
Fine tune with heims on lift bar
- E. Wehrs Double Sheer Steel Birdcage– Assembly and Location
 - 1. Shock Brackets– R.R. on inside of plates, L.R. on outside of plates
 - a. L.S. Front– 7” if running clamped
 - b. L.S. Rear– 7”
 - c. R.S. Front– 5”
 - 2. Location– Outside edge of rotor to Center of shock brackets
 - a. L.R.– 9”
 - b. R.R.– 8 3/4”
- F. Brake Brackets– **MUST BE DOUBLE PINNED TO AXLE TUBE!**- install caliper on backside of tube



4 Link Rear Suspension-continued

H. 4 Link Rods

1. L.S. rods towards the left of the double sheer cage mounts using supplied spacers
 2. R.S. rods towards the right of the double sheer cage mounts using supplied spacers
 3. Right links mounted in center, Left links mounted towards right of frame mounts using BRC custom spacers #83040, 83041, 83042
 4. Upper rods
 - a. 14" tube
 - b. 16 1/2" on center Left, 18 1/4" on center Right
 - c. 2nd hole from top Right, 4th hole from top Left
 - d. Standard holes (1" longer rod optional for Left Upper on frame)
 - e. center hole on birdcage (4 1/2")
 5. Lower rods
 - a. 12" tube
 - b. 15 1/2" on center Left, 15 3/4" on center Right
 - c. 2nd hole from top Right, 2nd hole from top Left
 - d. Standard holes (1" longer rod optional for Left Lower, 1 1/2" short Right Lower adapter bracket available)
 - e. center hole on birdcage (4 1/2")
 6. LR Brake Floater
 - a. 14" Tube
 - b. 17 1/4" on center
 - c. top hole on floater mounted inside with 1/2" spacer
 - d. 2nd hole down on frame (standard rod position) mounted towards the left of frame
- I. Square Rear- Set 4 link rods accurately
- J. Rear Shocks Angles
1. Over rail rear clip (gap between frame rail to center of shock brkt.)
 - a. Left rear front 2 1/2"
 - b. Left rear behind 1 3/4"
 - c. Right rear 4"



GENERAL INFORMATION

III. Set Up-scale with driver

- A. Fuel 20 Gallons
- B. Wheel offsets
 - 1. Left Front– 3” w/ 1” wheel spacer
 - 2. Right Front– 1” w/ 1” wheel spacer
 - 3. Rear- 3”
 - 4. Super slick– put 4” on right rear
 - 5. Super tacky– put 1” wheel spacer on right rear
- D. Percentages
 - 1. Left side– 55%
 - 2. Rear– 55%
- E. Bite
 - 1. Tacky 60# Left rear
 - 2. Average 80# Left rear
 - 3. Slick 100# Left rear

IV. Miscellaneous

- A. Wheelbase-110 “
- B. Brakes-Metric calipers w/.810 or 1” rotors
 - 1. LF, LR, RR– 2 3/4” piston
 - 2. RF– 2 3/8” piston
- C. Master cylinder
 - 1. Front– 7/8”
 - 2. Rear– 7/8”
- D. Rear End
 - 1. 60” Track centered
 - 2. 30 1/2” axles
- E. Drive shaft length
 - 1. Bert– 33 1/2”
 - 2. Brinn/Falcon– 30 1/2”

V. Remember

- A. All recommendations listed are general. Your situation may vary.
- B. All adjustments are a compromise. Think through what you are doing.
- C. Different race tracks require different combinations, due to Driver...
 - 1. Style
 - 2. Technique
 - 3. Experience

B.R.C. is interested in helping you all we can!

Simply pick up the phone and call our tech line at (717)-865-6691.

All calls will be answered or returned. Or e-mail us at lazerchassis@comcast.net

Use your computer for help. <http://www.bernheiselracecars.com>

Open Wheel Modified

PARTS LIST

Front Suspension

Upper ball joint holder– 22-0156
Control arm tubes– 19005, 19006, 19007
Upper ball joint– 20034-1/ Howe 2232012
Tubular Left lower control arm– 88010
Tubular Right lower control arm– 88020
Lower ball joint– 20036/ Howe 22412
LF Spindle– 30436L
RF Spindle– 30436R

Steering

LF tie rod– 19016
RF tie rod– 18015.5DB
Tie rod end– 30239/ Howe 23270
Idler Arm– 30261/ Howe 23432
Center link– 30270/ Howe 23399
Steering box– 206-06200
Pitman arm– 84091

4-Link Rear Suspension

Birdcage- WM200-1WDS-H (left) WM200NDS (right)
Birdcage shock mounts– WM200-7 (left) WM200-6 (right)
Brake Floater- WM200-16LSS
Brake Bracket– WM200-20HDR
Bolt on shock mount– WM2211500S
Lift bar– 29201M
Lower radius rod tubes– 19012 RS/ 18012 LS
Upper radius rod tubes– 19014 RS/ 19013 LS
Lift bar link rod– 19007
Panhard bar– 307-4205
Pinion mount- WM219
Integral Panhard Mount– 82159 Steel/ 83076 walk up
Roller Coil-over Eliminator– WM251-2
6th Coil– WM223400S

OPEN WHEEL MODIFIED

Shock and Spring Packages

I. L.R. Behind– Baseline

- A. RF– 73-10 w/ 600
- B. LF– 75-7 w/ 500
- C. RR– 94 w/ 13” 200
- D. LR– 98-2 (front) Coil-over Eliminator w/ 16” 150 (behind)
- E. Gas shocks are highly recommended, the above numbers are a general guide in old school valve codes, a custom set built to your specific needs is highly recommended.

II. 5th Coil– 93-5 shock with 11” 250 spring, center hole

III. LR drop– limit by chain clamped to the center of the axle tube (use part #84175– kit includes chain, frame mount, and rear end mount.) 15 1/2” from axle tube to ride height tab baseline

IV. Rear Spring Loads

- A. RR– 20.375” 360#
- B. LR– 20.75” 650#
- C. LR Droop load– 24.375 200# (only applies if using a super soft LR spring, must use a bump stop to set ride height load)

Please Remember:

These are basic setups designed to give you a base line starting point. Your situation may require additional tuning.

Tech Tips

I. Four Link

- A. More angle upward angle on rods (toward chassis) increases loading on that wheel (up in front, down in back)
- B. Rod angle changes also affect roll steer (typically lowering the lower rods at the frame decreases roll steer)
- C. Roll steer generally loosens the car through the center
- D. Lowering left upper rod on birdcage greatly increases drive off
- E. Specific rod angles
 1. Drop right upper for slick track
 2. Drop left upper for tacky track
 3. Raise right lower for tacky track
 4. Raise left lower for slick track

II. Lift bar

- A. Longer and softer on the 5th coil brings weight transfer/bite in slower but lasts longer
- B. Shorter and stiffer on the 5th coil brings weight transfer/bite in faster but does not last long

III. Panhard bar

- A. Shorter and more angle exaggerates wheel loading increasing side bite for a shorter time
- B. Longer and flatter smoothes out wheel loading and side bite

IV. Ballast

- A. Higher ballast causes the car to move around more (side to side and front to rear) increasing amount of weight transfer
- B. Lower ballast settles car down by limiting weight transfer

V. L.R. behind setup

- A. Amount of lift (roll-up) can be controlled by changing length of LR chain limiter
- B. Soft extension valving allows car to roll faster (valving controls speed,)

VI. Watts Link

- A. Many Lazer Chassis cars are equipped with a Watts Link bracket on the RR
- B. Remove RR top 4 link bar and install a new one going towards the rear
- C. This will loosen on throttle handling

VII. Driving

- A. Momentum and slick tracks require more driver finesse and a smoother less radical setup
- B. Stop and go tracks and traction tracks can more easily handle a radical combination and a stomp and steer driver

Notes:

