

# **LAZER** **CHASSIS** *The Ultimate Weapon*

**2010 and older**

Serial # 1658 and older



*Manufactured By:*

**Bernheisel Race Cars**

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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.lazer3.com](http://www.lazer3.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**

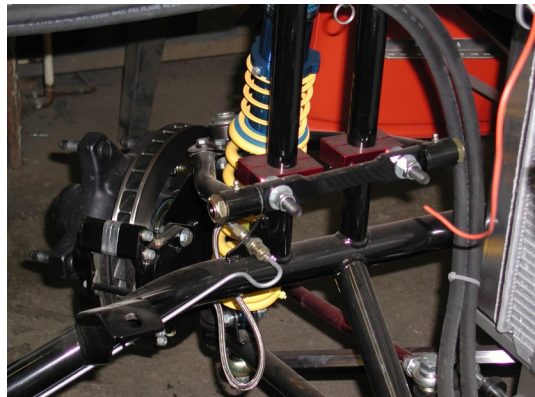
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THIS MERCHANDISE.  
THE PURCHASER ASSUMES ALL RESPONSIBILITY*



## *Front Suspension*

### *I. Wide Front End*

- A. Upper Control Arms
  - 1. Right– 8 1/4” w/ 3/4” spacers
  - 2. Left– 11 1/2” - Mounted inside frame
  
- B. A-arm sliders – top of frame to top of block
  - 1. Single position mounts Stop and Go track
    - a. Left front– 4 3/8”
    - b. Left rear– 4 1/8”
    - c. Right front– 4 3/8”
    - d. Right rear– 4 1/8”
  - 2. Single position mounts Momentum track
    - a. Left front– 4 3/8”
    - b. Left rear– 4 1/8”
    - c. Right front– 3 3/8”
    - d. Right rear– 3 1/8”
  - 3. Dual position mounts
    - a. Left front– 5 3/8”
    - b. Left rear– 5 1/8”
    - c. Right front– 4 3/8”
    - d. Right rear– 4 1/8”
  - 4. Dual position mounts
    - a. Left side– use bottom holes
    - b. Right side Stop and Go– use top holes
    - c. Right side Momentum– use bottom holes
  
- C. Lower control arms
  - 1. Left– 17 1/8” on center
  - 2. Right– 19 3/4” on center
  
- D. Strut rods– Initial setting- As short as possible
  - 1. Front strut
    - a. RF 23” tube
    - b. LF 22” tube
  - 2. Rear strut
    - a. RF 20” tube
    - b. LF 18” tube

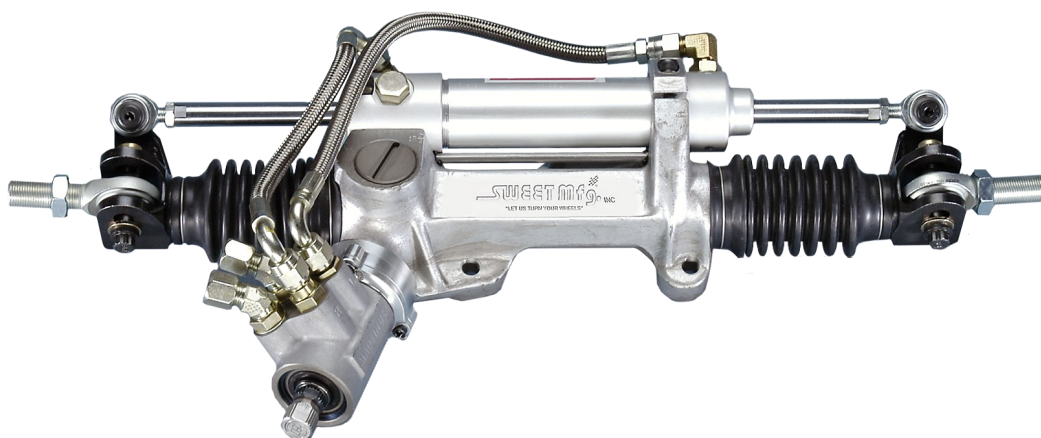




## *Front Suspension-continued*

E. Rack spacers-at mount ( Center rack in slots on frame bracket ) 1/4"

**Sweet w/ slotted rack eyes recommended**



18 1/4" Rack- baseline 4" w/ .220 servo

F.

G. Bump steer spacers

1. Standard spindle RS- 1/8" spacer LS- no spacer
2. Ackerman spindle RS- 3/8" spacer LS- 1/4" spacer
3. At rack- Lay a straight edge across top of main frame rails. From top frame to center of heim 5 5/8" on both sides.
4. Ackerman spindle steering arm settings (center of ball joint to center of heim)  
RS- 4 15/16" LS- 5 1/16"



H. Tie rod tubes- 16" tube RS ( Use RS to adj. Toe out )  
15" tube LS ( 18" Center to Center )



## *Front Suspension-continued*

### I. Alignment

1. Camber– Right side, 5 degrees Neg. Left side, 4 1/2 degrees Pos.
2. Caster– Right side, 6 1/2 degrees Left side, 3 1/2 degrees
3. Toe 1/4" out
4. Bump steer– If Rack & Tie-Rod spacers are used as Instructed, Bump Steer Will be Correct
5. Alignment Procedure
  - Place the chassis on 4 jack stands
  - Level car front to back & side to side
  - Remove coil-overs
  - Support lower control arms to simulate ride height (use #8415 ride height sticks)
  - Adjust strut rod length to set *caster*
  - Space upper control arm in & out to set *camber*

### J. Front ride height

1. Right lower control arm 1.5 – 2.2 degrees
  2. Left lower control arm 2.8 – 3.5 degrees
- Both are uphill from chassis to wheel





## Link Rear Suspension

### II. 4 Link Rear Suspension

A. Lift Bar Slider– 13 1/4” center to center from top right rail

B. Lift Bar– Adjustable 30” - 44”

1. 5/8” Bolt in top (grade 8)- Head @ Heim
2. 1/2” Bolt in bottom (grade 8)- Head @ Heim
3. 7/8” Spacer between rod end and plate
4. Mount on right side of aluminum plate
5. Use spacer for strength between plates
6. Initial setting– 4th hole (middle)
7. Left bar side brace- 7” tube 10 1/4” on center
8. Rear end through bolts on lift bar plates torque to 35 ft. lbs.  
( Over tightening can cause breakage)



C. Rear End Adjustment (side to side)

1. Left upper torque arm plate to left ride height tab– 13 1/2” w/Ride height @  
8 7/8” LR and 8 5/8” RR
2. Panhard bar
  - a. R.S. pinion- 2nd from bottom (4 hole mount) 0 mark on slotted mount
  - b. At frame w/ 3 position bracket. 3rd hole from top #3– Middle row of holes  
0 mark on slotted mount
  - c. 21” center row ( Note option for 19” or 23” Panhard ) 21” is baseline setting  
19” recommended for stop and go or slick tracks  
23” recommended for rough and extremely heavy tracks



4 Hole Mount



Walk-up Mount



Walk-up Brkt.



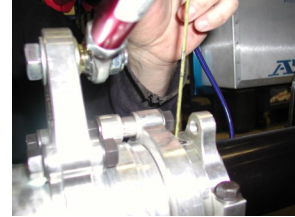
3 Position Brkt



## *4 Link Rear Suspension- Continued*

### D. Rear Ride Height

1. TWM birdcages– tab to top of birdcage body ( Smallest part of birdcage )
  - a. Left ??? Depends on LR bite ( 8 7/8” to 9 1/2” )
  - b. Right 8 5/8”
2. BSB birdcages– tab to top of axle tube
  - a. Left ??? Depends on LR bite (9 1/8” to 9 3/4”)
  - b. Right 8 7/8”



E. Pinion Angle– 7.5 degrees negative- Put angle finder on rear cover nuts

### F. Birdcage– Assembly and Location

1. Shock Brackets
  - a. L.S. Front– top holes– shock low (adjust to achieve 13 3/4”- 14 1/4” axle drop)  
Drop is changed when making rod adjustments, use the bracket to maintain drop  
Inside of birdcage towards center of the car
  - b. L.S. Rear– lower holes outside of birdcage towards outside of the car
  - c. R.S. Front– lower holes inside of birdcage towards center of the car

G. Brake Brackets– located by the birdcage, pin to axle tube with supplied bolts

### H. TWM Birdcages 4 Link Rods-Neutral Setting

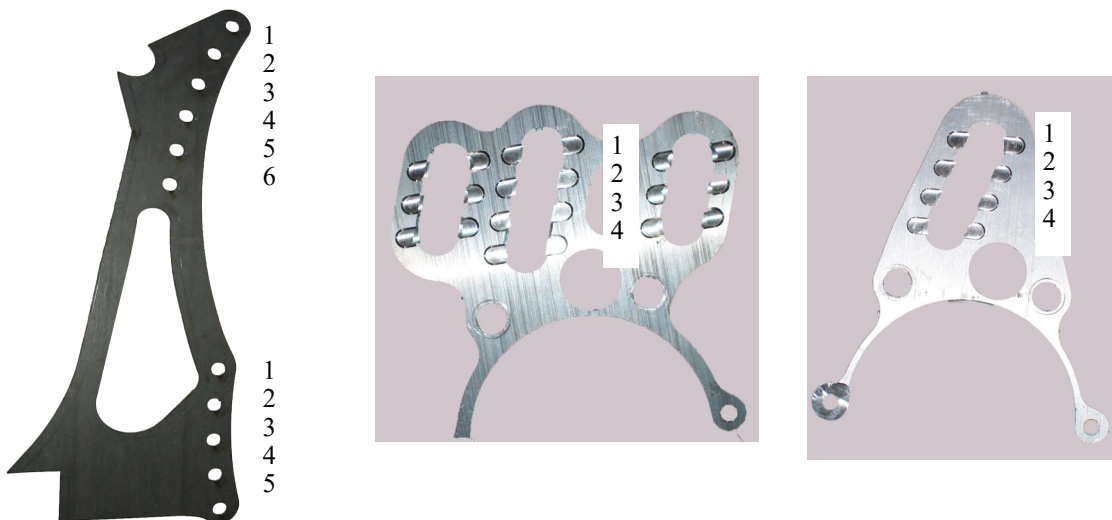
1. L.S. rods on outside of birdcage with 1/2” spacer w/ supplied 1/4” spacer ( total of 3/4” )
2. R.S. rods on inside of birdcage with 1/4” spacer
3. Center all 4 link rods in front brackets– w/ BRC spacer # 83040
4. Upper rods
  - a. 14” tube
  - b. 17 1/2” on center
  - c. LS
    - Center set of slots
    - # 1 Index
  - d. RS
    - # 1 Index
  - e. Frame 3rd hole from top- # 3 (Both upper rods)
5. Lower rods
  - a. 12” tube
  - b. 15 1/2” on center
  - c. Frame center hole- # 3
  - d. Bottom holes on birdcage



## 4 Link Rear Suspension- Continued

- I. BSB Birdcages w/ brake floaters 4 Link Rods-Neutral Setting
1. L.S. rods on inside of birdcage with supplied spacer
  2. R.S. rods on outside of birdcage with supplied spacer
  3. Center all 4 link rods in front brackets- w/ BRC spacer # 83040
  4. Upper rods
    - a. 14" tube
    - b. 17 1/2" on center
    - c. # 1 Index on b-cage
    - e. Frame 3rd hole from top- # 3 (Both upper rods)
  5. Lower rods
    - a. 12" tube
    - b. 15 1/2" on center
    - c. Frame center hole- # 3
    - d. Bottom holes on birdcage
  6. Brake rods
    - a. 15" tube
    - b. 18 1/4" on center
    - c. LS 2nd hole from top on frame- #2
    - d. RS 4th hole from top on frame- #4
    - e. both rods top hole on floater

(note- hole #5 is not available on RR)







## *4 Link Rear Suspension- Continued*

### J. Square Rear

1. Set 4 link rods accurately or
2. Drop a plumb bob from axle tube and measure to 2 x 2 outriggers

### K. Damper Shock– 6” stroke

1. Center hole on rear (vertically)
2. Back holes on frame plate
3. 3rd hole from top on frame

### L. Rear Shocks Aluminum Brackets

1. Over rail rear clip (gap between frame rail and slider mount)
  - a. Right 3 1/2”
  - b. Left Front 4”
  - c. Left Behind 3”

### M. 5th Coil Pre-load

1. 7” Shock
2. 10” Spring
3. Center hole on lift bar
4. Back off when scaling car
5. Adjust nut until coil is seated
6. Pre-load 2 turns- (Afc) For other brands use 1/4”
7. Straight up & down– No angle

### N. Rear Alignment Procedure

- Place the chassis on 4 jack stands
- Level car front to back and side to side
- Remove rear coil-overs
- Support rear housing to simulate ride height (use #8415 ride sticks)
- Set 4-link rods center to center
- Adjust Mini-sixth coil to set pinion angle
- Adjust panhard bar to set side to side measurement



## *General Information*

### III. General Information

A. All scale work with 15-20 Gallons of Fuel and driver

B. Wheel offsets all 5"

C. Stagger

1. Front- 1"
2. Rear- 3 1/2"

D. Percentages

1. Left side- 54.5%
2. Rear- 53.5-54.5%

E. LR Bite

See set-up packages for recommended weights

F. Drive Shaft

1. Bert Ballspline- 38"-38.5"
2. Std. Bert- 38" with extra long yoke
3. Brinn & Falcon- 35" with extra long yoke

G. Master cylinder

- | <u>Tacky Track</u> | <u>Slick Track</u> |
|--------------------|--------------------|
| 1. Front- 1"       | Front- 7/8"        |
| 2. Rear- 7/8"      | Rear- 1"           |

H. Axles

1. R.R. 36"
2. L.R. 32 1/2"

I



## *Replacement Parts*

### *V. Replacement Parts*

#### **Wide Front Suspension Front Strut**

Left upper control arm– 01-1120DBJ  
Right upper control arm– 03-0810  
Upper ball joint– 20031 LS / 20034 RS  
Left lower control arm– 25-1170-5  
Right lower control arm– 25-1190-5  
Lower ball joint– 20036  
Strut tube– 42-2302-AC RS / 42-2202-AC LS  
Strut end– RD3  
Tie rod tube– 12016 RS / 12015 LS  
Standard left spindle– 30397  
Standard right spindle– 30398  
Ackerman left spindle– 40397A  
Ackerman right spindle– 40398A

#### **Rear Strut**

Left lower control arm– 21175  
Right lower control arm– 21195  
Strut tube Alum. Hex– 14020 RS / 14018 LS

#### **Front Suspension Options**

Howe upper ball joint– 22300 LS / 22320 RS  
Howe lower ball joint– 22412  
Howe right upper control arm– 2213307H  
Howe left upper control arm– 2214500H  
Joe's bearing right upper control arm– 15705-slb  
Joe's bearing left upper control arm– 15370-slb



## *Replacement Parts continued*

### **G-2 Rear Suspension**

TWM Left Birdcage– 119-341860  
TWM Right Birdcage– 119-421560  
Bolt on shock mount– 20390  
Lift bar– 29201  
Lift bar plates– 29100 (alum.) 29100S (steel)  
Lower radius rod tubes– 12012  
Upper radius rod tubes– 12014  
Lift bar link rod– 12009  
Panhard bar– 20225K-21  
Pinion mount– 82149  
Mini 6th coil assy.– 26400  
Over rail Integral Panhard Mount– 82129S

### **Rear Suspension options**

BSB Right Birdcage– 84500  
BSB Left Birdcage– 84510  
Brake rod tubes– 12015  
Walk-up pinion mount– 84027  
Walk-up frame mount– 83076



## *Set-up Packages*

### *V. Set-up Packages*

*Note: All setups based on Afco twin tube 13-Series shocks. See Lazer M-2 guide when using those shocks. Genesis G-1 and Afco T-2 double adjustable also available*

#### A. Baseline-

1. Springs– call our shock department for the latest spring combinations

	L.F.	500#	R.F.	275# w/ bump
(Behind)	L.R.	150#	R.R.	250#

2. Shocks– call our shock department for the latest information

3. 4-Link Bars, All standard settings except R.H. lower, #2 on frame  
L.H. upper, #3 on frame

4. Panhard, All standard settings at pinion, Down 1 hole at frame

5. 60# L.R. Bite

6. 5th Coil Middle hole 300# spring 73 shock

7. 14 3/4" LR drop

### **Please Remember:**

**These are basic setups designed to give you a base line starting point. Your situation may require additional tuning. There are literally millions of adjustments and combinations. For maximum results the best total package for your driver and track conditions must be achieved. There is no magic. Keep good records and work hard.**

**NOTES:**