

### How CHOCKFAST® Helps Maintain Alignment

Technical Bulletin # 639C

#### Bulletin Description

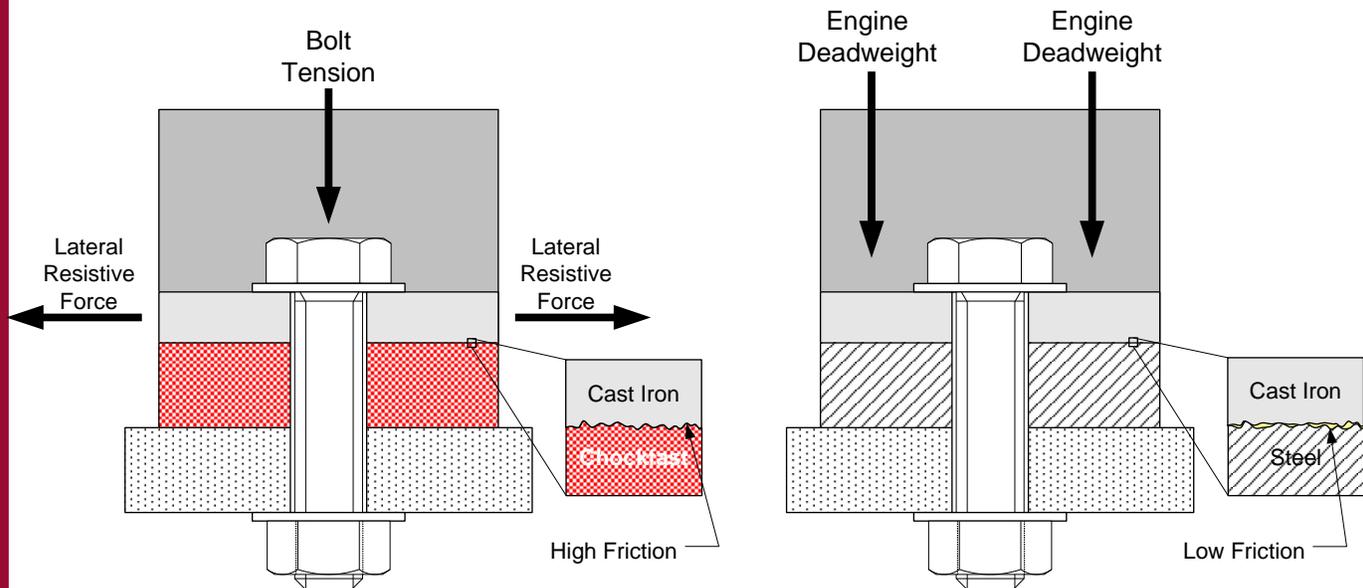
Maintenance of alignment in reciprocating machinery such as large diesel engines and compressors is of critical importance to operators. Without it, the possibility of broken crankshafts, worn bearings and associated machinery downtime greatly increases.

#### Benefits of CHOCKFAST

With CHOCKFAST Resin Chocks, the maintenance of equipment alignment is improved dramatically when compared to installations that use steel chocks. There are many cases of improved alignment provided by CHOCKFAST when used as a direct retrofit for steel chocks under troublesome engines.

#### Reasons For Success

The key reason for the success of CHOCKFAST Resin Chocks is that they produce a higher lateral resistive force when compared to steel chocks under cast iron bedplates. The coefficient of friction between CHOCKFAST Resin Chocks and cast iron is 0.7 as compared to 0.15 for steel to cast iron. An independent engine manufacturer during an extensive test program (Sulzer Brothers - Winterthur, Switzerland), established these coefficients. The following examples illustrate the superior total lateral resistive forces derived from the use of resin chocks:



**Engine Deadweight plus Bolt Tension work to hold the engine in place.**

**Friction also helps hold the engine in place.**

**Friction plus Engine Deadweight plus Bolt Tension = Total Lateral Resistive Force**

**The higher the Total Lateral Resistive Force, the higher the forces available to maintain alignment.**

Because CHOCKFAST fills every little crease and crevice in the mounting foot, the friction between CHOCKFAST and cast iron is much larger than between steel and cast iron.

## Examples

Let's compare the total resistive force available from CHOCKFAST Resin Chocks to steel chocks for three Diesel Engines:

### **Example 1: DRESSER CLARK HBA8**

Engine Deadweight = 170,000 lbs.

Hold Down Bolts & Tension Per Bolt = (19) 1-1/2" Main Frame Bolts @ 25,560 lbs/bolt

Assume all load is on (19) - 10" x 10" Main Frame Chocks

Total Normal Load = Engine Deadweight + All Bolt Tensions = 170,000 lbs + 19 x 25,560 lbs. = 655,640 lbs

Total Resistive Force Of CHOCKFAST Resin Chocks To Cast Iron Engine Bedplate = Coefficient of Friction of CHOCKFAST Resin Chocks to Cast Iron x Total Normal Force = 0.7 x 655,640 lbs = 458,948 lbs

Total Resistive Force Of Steel Chocks To Cast Iron = Coefficient of Friction of Steel Chocks to Cast Iron x Total Normal Force = 0.15 x 655,640 = 98,346 lbs.

Forces available to help hold alignment: 1) with CHOCKFAST Resin Chocks = **458,948 lbs.**  
2) with steel chocks = **98,346 lbs.**

### **Example 2: COOPER ENERGY 16V-250**

Engine Deadweight = 270,000 lbs.

Hold Down Bolts & Tension Per Bolt = (20) 2" Main Frame @ 45,500 lbs./bolt

Assume all load is on 20 Main Frame Chocks

Total Normal Load = Engine Deadweight + All Bolt Tensions = 270,000 lbs. + 20 x 45,500 = 1,180,000 lbs.

Total Resistive Force Of CHOCKFAST Resin Chocks To Cast Iron Engine Bedplate = Coefficient of Friction of CHOCKFAST Resin chocks to Cast Iron x Total Normal Force = 0.7 x 1,180,000 lbs = 826,000 lbs.

Total Resistive Force If Steel Chocks Used = 0.15 x 1,180,000 lbs. = 177,000 lbs.

Forces available to help hold alignment: 1) with CHOCKFAST Resin Chocks = **826,000 lbs.**  
2) with steel chocks = **177,000 lbs.**

### **Example 3: INGERSOLL RAND KVG-412**

Engine Deadweight = 140,000 lbs.

Hold Down Bolts & Tension Per Bolt = (18) 1-1/2" Main Frame Bolts @ 25,560 lbs./ bolt

Assume all load is on 18 Main Frame Chocks

Total Normal Load = Engine Deadweight and Total Bolt Tensions = 140,000 + 18 x 25,560 = 600,080 lbs.

Total Resistive Force Of CHOCKFAST Resin Chocks To Cast Iron Engine Bedplate = Coefficient of Friction of CHOCKFAST Resin Chocks to Cast Iron x Total Normal Force = 0.7 x 600,080 lbs = 420,056 lbs.

Total Resistive Force If Steel Chocks Used = 0.15 x 600,080 lbs. = 90,012 lbs.

Forces available to help hold alignment: 1) with CHOCKFAST Resin Chocks = **420,056 lbs.**  
2) with steel chocks = **90,012 lbs.**

**CONCLUSION: CHOCKFAST resin chocks provide 4 to 5 times the resistive force of steel chocks.**

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