ADDING LEAVES TO “BUILD UP” A SPRING

General Overview

Spring repair shops are often requested to build up leaf springs by adding additional leaves to an existing spring assembly to increase the carrying capacity of a vehicle.

While the addition of leaves will increase the load carrying capacity of the spring, a number of things must be considered before proceeding.

a. Correct stepping equalizes the stress between all leaves so each leaf carries its fair share of the load. Selection of the thickness and number of leaves is important so as not to disrupt the original stepping any more than is absolutely necessary.

b. Ride quality will suffer since extra leaves will increase the spring rate (stiffness).

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c. The vehicle ride height will be increased due to the increased spring stiffness and the additional thickness of the added leaves (when the spring is mounted over the axle).

d. When the main leaf has eyes, the chance of eye breakage is increased when the suspension is loaded above its original capacity since the steel gauge of the main leaf may not be heavy enough for the increased stress.

e. While the built up spring may carry the additional load, the capacity of the axle or other suspension components has not been changed. Carrying loads which exceed the maximum allowable axle capacity will cause premature failure to the axle or steering components.

f. The extra leaves are almost always made from repair plates which are not shot peened and often must be heavily fit to match the spring. Therefore, the added leaf(s) will often be the least durable in the entire spring assembly.

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Rules for Adding Leaves

If a few simple rules are followed, minor increases in a spring carrying capacity can be made by adding leaves.

a. **Never increase the capacity of a spring beyond the ratings of the axles, steering system, suspension or brakes on the vehicle.**

b. **Under no circumstances may a leaf be added to a full taper spring unless that leaf is specifically designed for that purpose.**

Properly Stepped Spring

Extra Leaf Added - Same Length as Main Leaf Improperly Stepped Spring

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c. Step the leaves into the original leaves to minimize the disruption of the stress distribution of the spring.

d It is always better to add two thinner leaves than one thick leaf.

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e. Determine if adding leaves is the real solution to the customer’s problem before proceeding.

1. Are the springs on the vehicle now the same as came on it new?

2. Has the vehicle been modified? If so, define completely.

3. How much weight is being normally carried on the axle(s)?

4. What are the symptoms?

— Sitting low on one side only? How much low?

— Breaking leaves? Which one? Eye leaves?

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Determining Capacity of Leaves

The approximate additional carrying capacity of an additional leaf in one spring may be obtained from the following charts.

Step 1: Identify the width and gauge of the leaf to be added.

Step 2: Measure the division lengths of the main leaf. (Not the length of the leaf you are adding.) If one or both ends are slipper types, use an estimated division length where the hanger contacts the spring.