WHEELS DEFECTS

PK DUBEY LECT/C&W

WHEELS DEFECTS

Wheel defects
and
their condemning limits
Wheel defects Standard
and
Condemning Limit

Sharp Flange Standard 14.5 mm
Condemning Limit 5 mm or Less
Thin Flange Standard 28.5 mm
Condemning Limit 16mm or Less

Less radius at root of flange

Standard 16 mm-IRS 14 mm-WWP

Condemning Limit 13 or Less

Deep Flange

28.5 mm /35mm or more

Hollow Tyre

5 mm or above

Thin Tyre

Since no tyred wheel, dia of the wheel is the criteria.

Flat Tyre

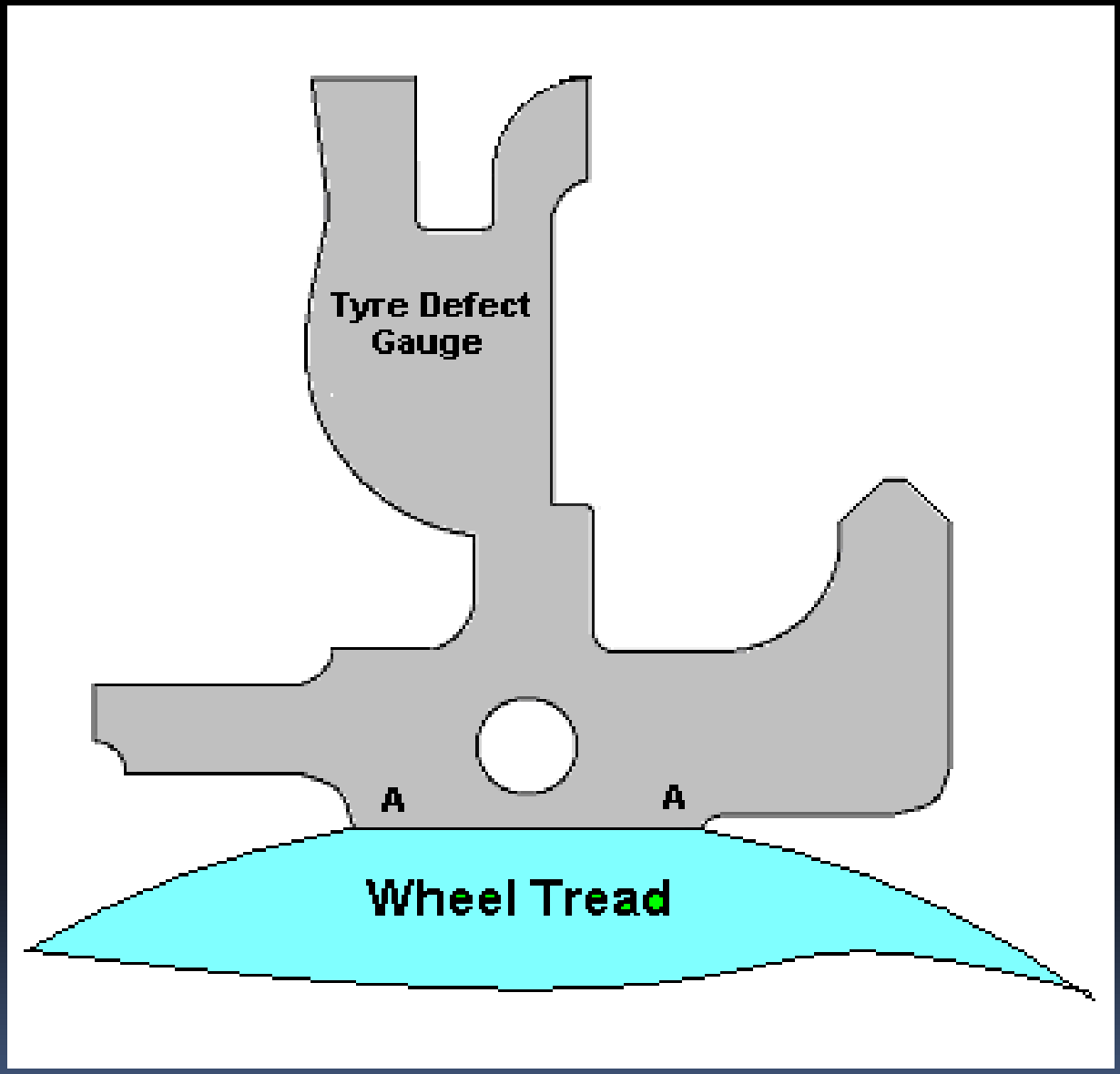
Coaching Stock

50 mm or more

And

Goods Stock

60 mm or more


Tyre Defect
Gauge
A
A
Wheel Tread

Less radius at Root of Flange:

Standard 16 mm-IRS

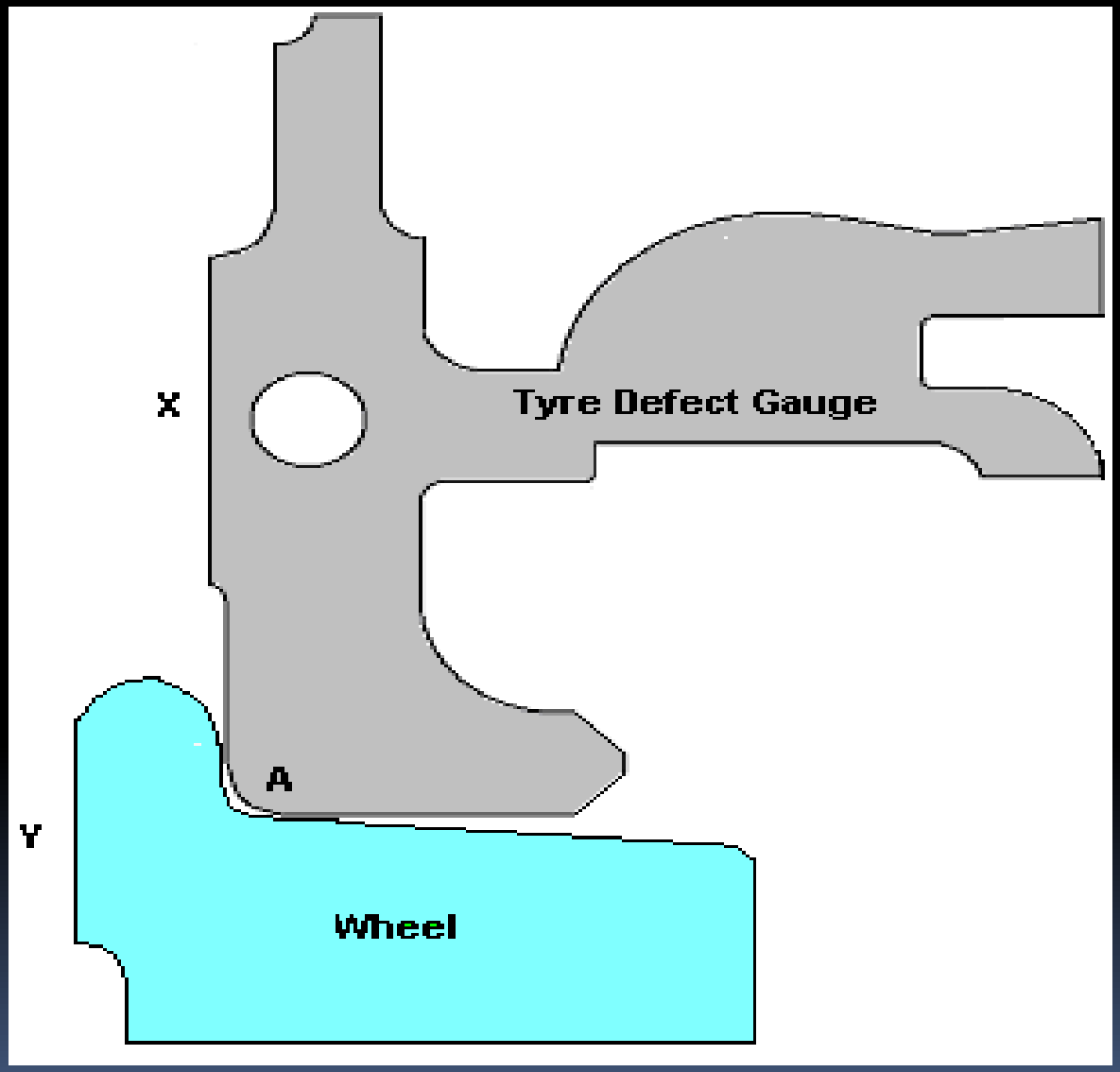
and

14 mm-WWP

Condemning Limit

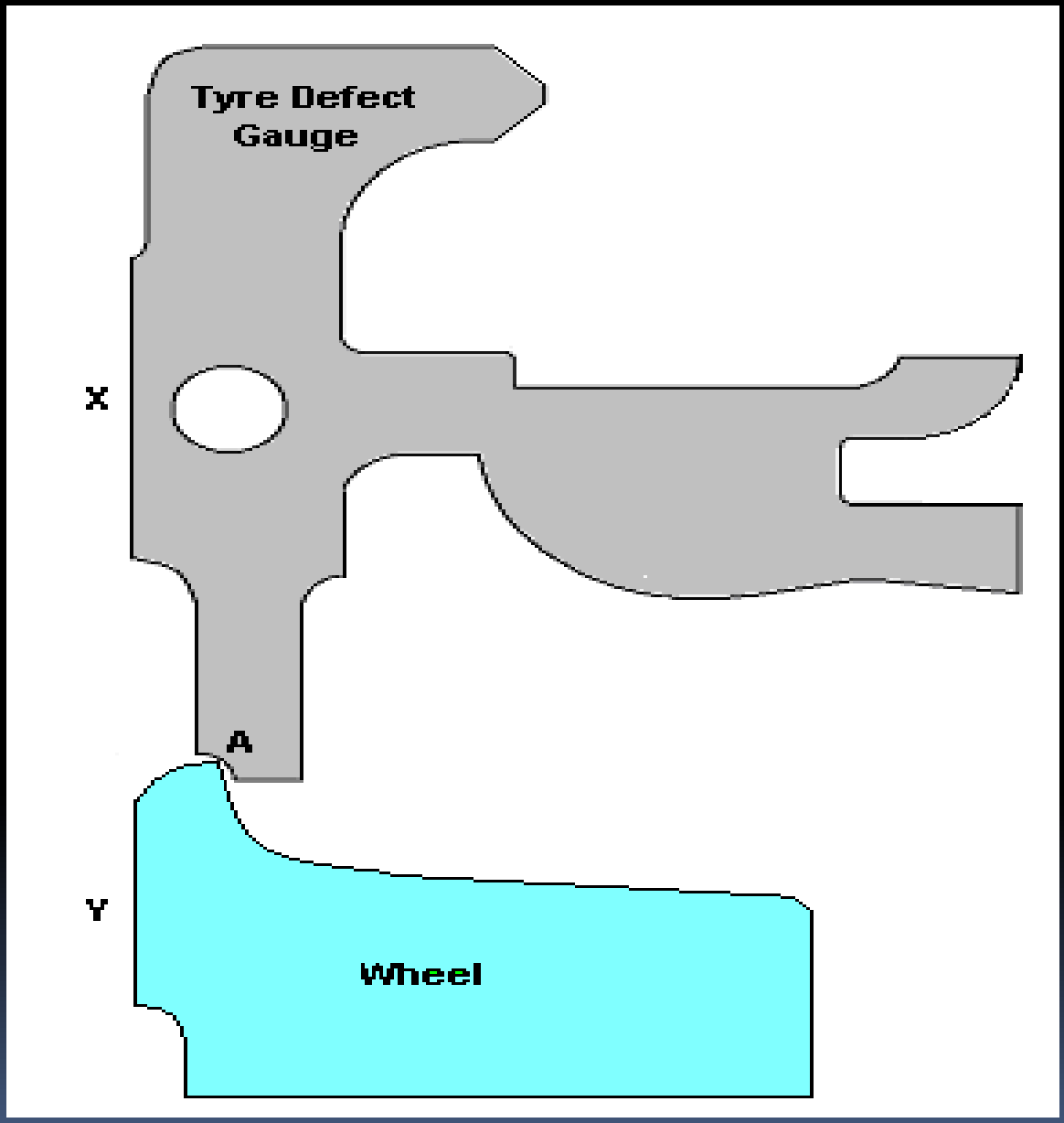
13 or Less

When radius given at the root of flange is reduced to 13 mm is called less radius at root of flange.This defect can develop into other defects such as deep flange and hollow tyre


X
Tyre Defect Gauge
A
Y
Wheel

Sharp Flange:

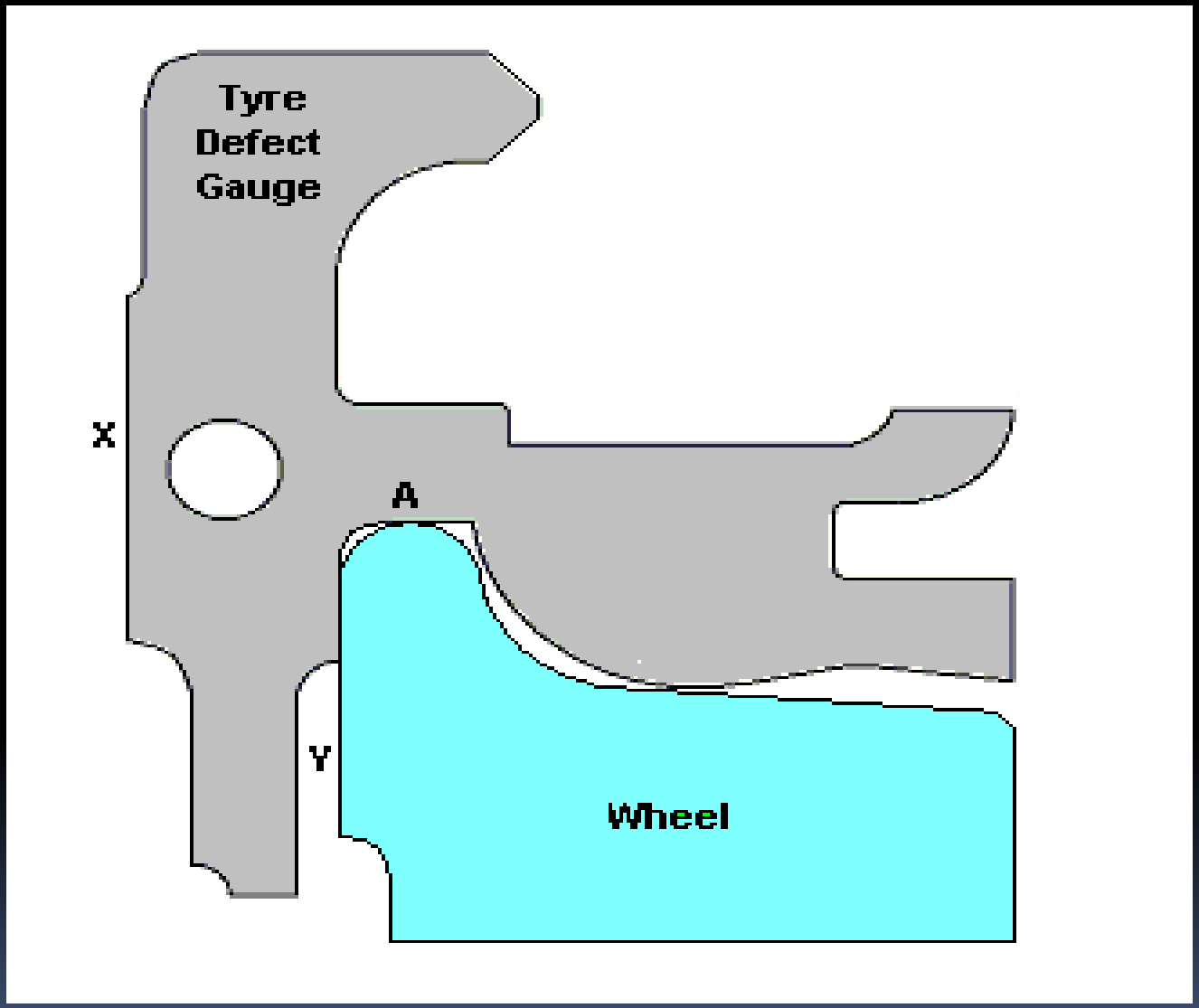
When the radius given at the tip of flange is worn out to 5mm, it is called sharp flange. This defect develops either due to running on the same curves for a along period or due to the defects on the rolling stock such as bent axle guard, weak springs, defective axle guides and excessive longitudinal clearance


Tyre Defect
Gauge
X
A
Y
Wheel

The wheel is always
pushed towards the rail and the flange starts wearing. The root of flange is first affected and then the inclination given on the flange disappears. Slowly the roundness given on the flange is reduced Sharp flange can take wrong routes at a facing point provided the point itself is slightly defective such as a split, a worn out or
damaged switch rail etc.

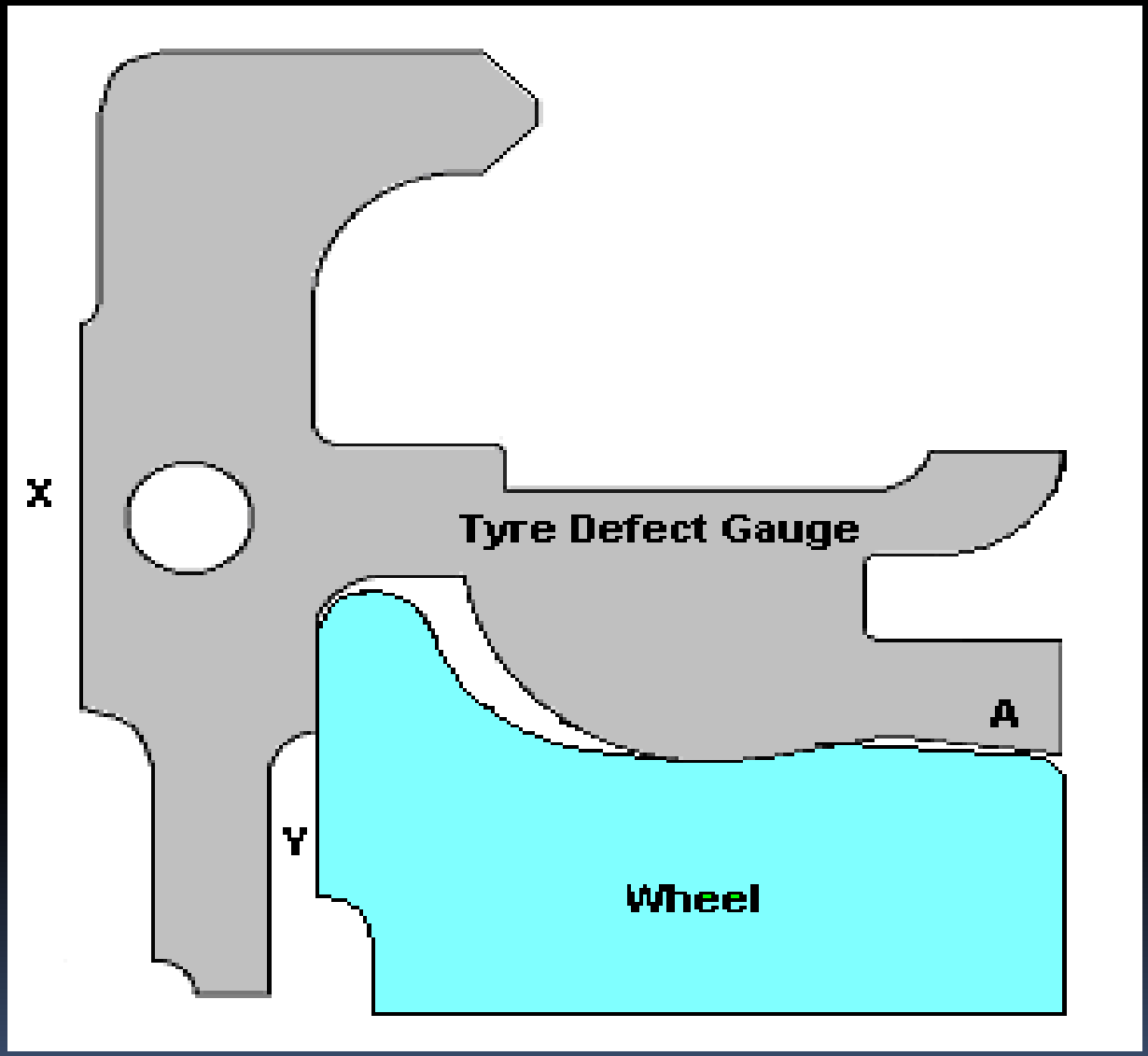
Deep Flange:

When the depth of the flange is increased to 35 mm for BG stock,
it is called Deep flange. This happens due to the wear of the wheel tread at the root of the flange. A deep flange can cause damage to the permanent way by mounting over fish plate, fish bolts, check bolts etc. and also causes derailments especially at check blocks and check rails


Tyre
Defect
Gauge
X
A
Y
Wheel

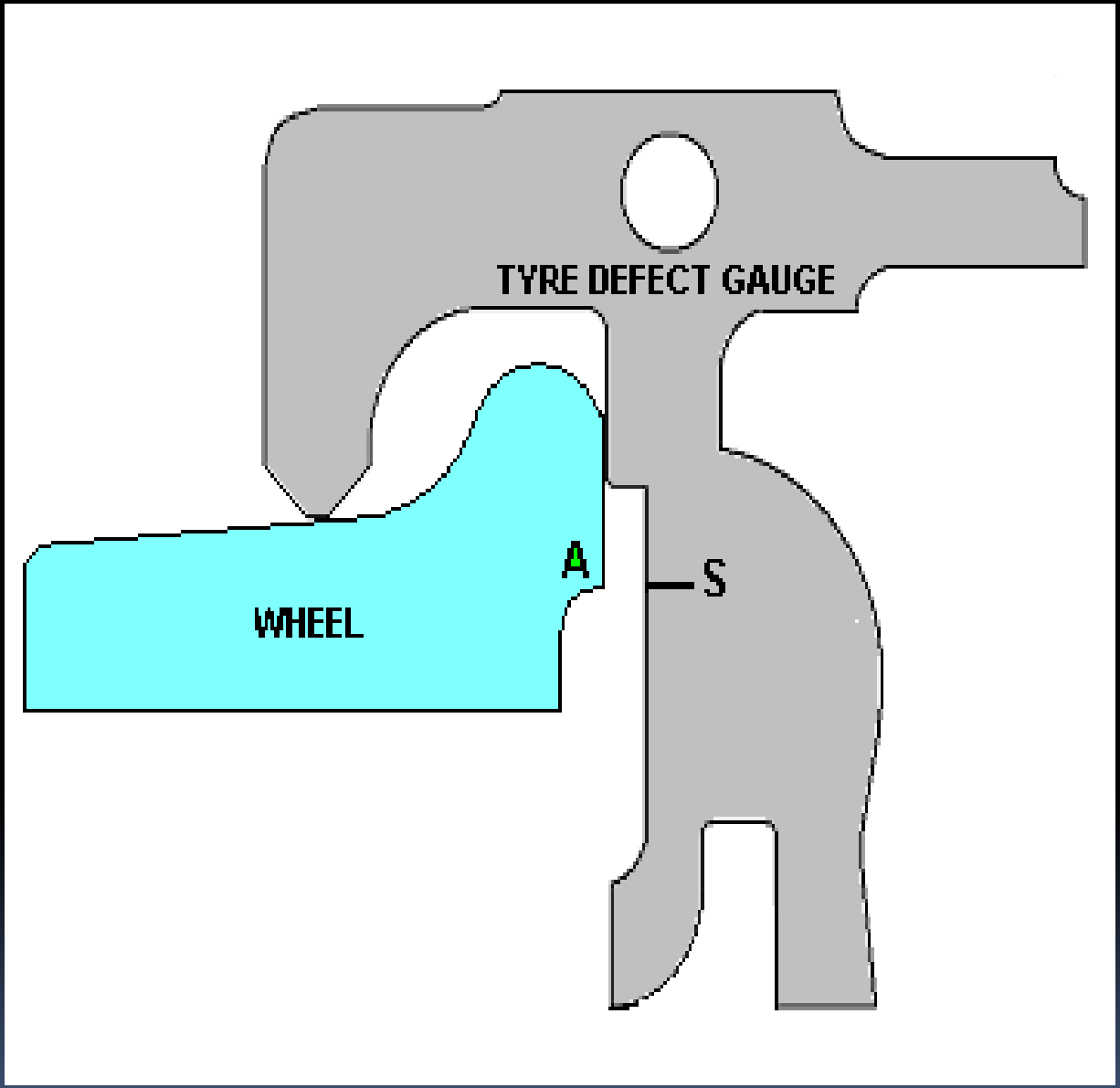
Hollow Tyre:

Due to wear on the wheel tread caused especially by wrong material composition in brake blocks, the inclination given on the wheel tread wears out and forms curve. Without this inclination on the tyre wheel will have more lateral play on a straight line causing rough riding. It will also find very difficult to negotiate curve.


X
Tyre Defect Gauge
A
Y
Wheel

Thin tyre:

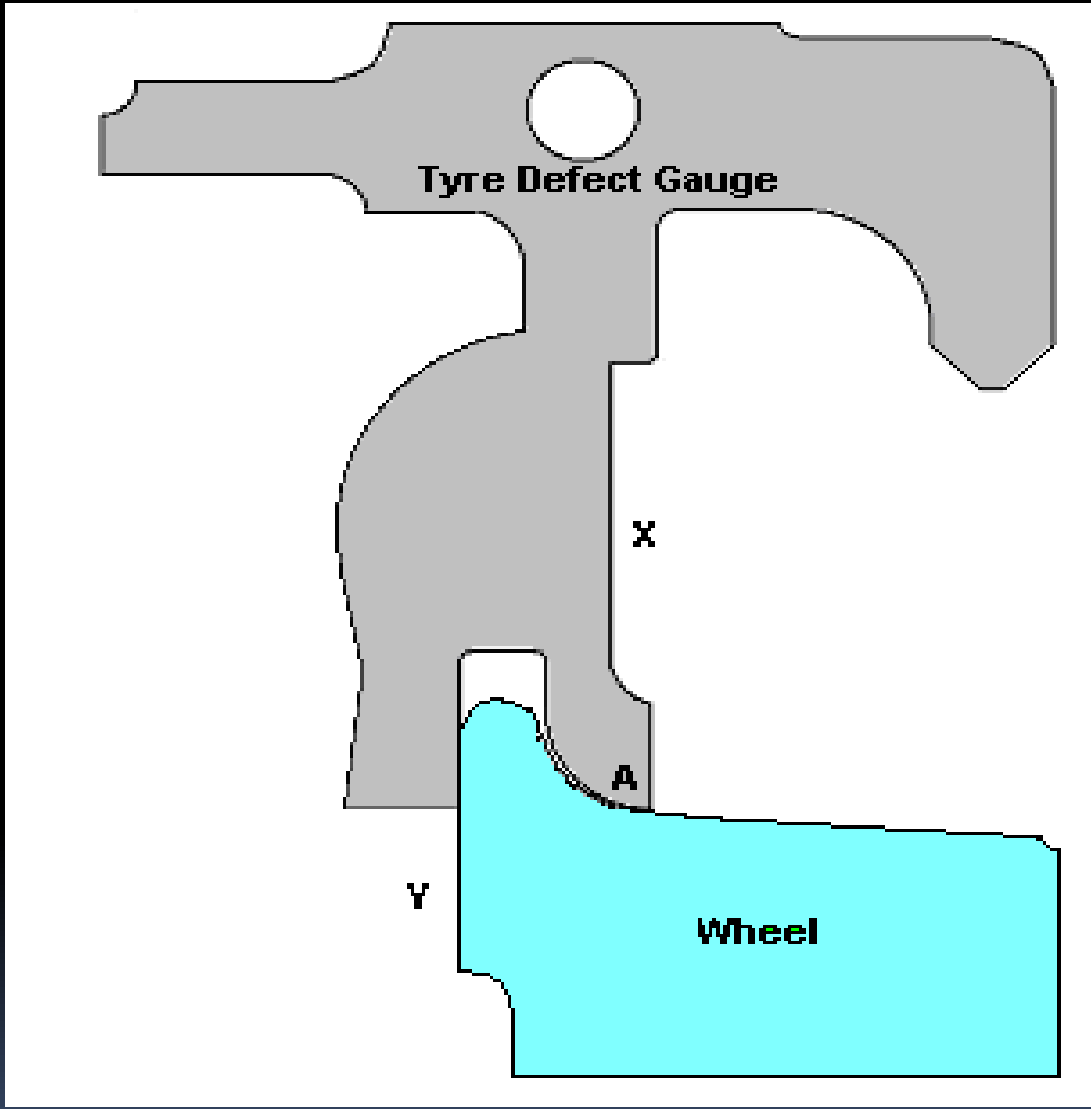
When the thickness of the tyre is reduced to 25 mm for BG is called thin tyre. This happens due to wear and tear in ordinary condition. Wheel with thin tyre will not be able to withstand the weight of the load. This also will cause low buffer heights.


TYRE DEFECT GAUGE
A
S
WHEEL

Thin Flange:

When the thickness of flange is reduced to 16mm is called Thin Flange Thickness must be measured at a point 13 mm from the Tip.

It leads to breakage of flange under the side thrust of the wheel on a curve


Tyre Defect Gauge
X
A
Y
Wheel

Skidded Wheel:

This happens due to defective brakes or improper releasing ofbrakes. When a rolling stock is kept running with brakes binding the wheels do not revolve. Instead they slide over the rail surface.This cause heavy friction and wear on a particular spot on wheel tread. These worn out spots or patches will cause heavy noise on run and disturb the passengers. A skidded wheel not only damagesthe permanent way but also bearings.

Shattered Rim;
A wheel with a fracture on the tread or flange must be withdrawnfrom service. Shattered Rim is a rejectable defect.(This does not include wheels with localized pitting or flakingwithout presence of any rejectable condition).

Spread Rim; If the rim widens out for a short distance on the front face, aninternal defect may be present. Spreading of the rim is usuallyaccompanied by a flattening of the tread, which may or may nothave cracks or shelling on the tread. Such wheels must be withdrawn from service.(This condition should not be confused with a uniform curling overof the outer edge of the rim around the entire wheel, which is
called rim flow. Rim flow is not a rejectable defect).

Shelled Tread; Shelling can be identified by pieces of metal breaking out of thetread surface in several places more or less continuously around therim. Shelling takes place when small pieces of metal break out between the fine thermal checks. These aregenerally associatedwith small skid marks or “chain sliding” Suchwheelsshould bewithdrawn from service and sent to workshops for re-profiling.

Thermal Cracks; Thermal cracks appear on a wheel tread due to intense heating ofthe wheel arising out of severe brake binding. Such cracks occur onthe tread and generally progress across the tread in a transverse &radialdirection. Whenever suchacrack becomes visible on the outer face of the rim or tread crack has reached the outer edge(non-gauge face) of the rim, the wheel should be withdrawn from service.

If a crack becomes visible on the outer flange face, thewheel should be withdrawn from service. Such wheels should be sent to workshop for examination and subsequent rejection.Wheels involved in brake binding during service, should be examined carefully during the maintenance to rule out thepossibility of rejectable thermal cracks. Such wheels may be identified by presence of flats (even within acceptable limits) and severe discoloration or blue/ black heating marks on the tread.

Heat checks; Fine superficial cracks visible on the tread on or adjacent to the braking surface are called heat checks, which are usually denser than the thermal cracks. Heat checks are caused on the tread due to heating and cooling cycles undergone by the wheel during normal braking. Such wheels need not be withdrawn but should be carefully distinguished from the rejectable thermal cracks.

Disc crack;

A crack on the disc due to material failure is called disc crack. The wheel should be with drawn from service.

Loose axle:- While assembling wheel with axle proper interference should be maintained between wheel and axle. Due to improper selection of interference the wheel may shift outwards or it may come out completely. Loose axle is a rejectable defect.

Thank You